



Control Number: 51415



Item Number: 277

Addendum StartPage: 0



SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415

APPLICATION OF SOUTHWESTERN §  
ELECTRIC POWER COMPANY FOR §  
AUTHORITY TO CHANGE RATES §  
BEFORE THE STATE OFFICE  
OF  
ADMINISTRATIVE HEARINGS

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS  
FOR INFORMATION**

**MARCH 29, 2021**

**TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>FILE NAME</u></b>	<b><u>PAGE</u></b>
Response No. CARD 9-1	51415 CARD09 Pkg.pdf .....	3
Response No. CARD 9-2	51415 CARD09 Pkg.pdf .....	4
Attachment 1 to No. CARD 9-2	51415 CARD09 Pkg.pdf .....	5
Response No. CARD 9-3	51415 CARD09 Pkg.pdf .....	8
Attachment 1 to No. CARD 9-3	51415 CARD09 Pkg.pdf .....	9
Response No. CARD 9-4	51415 CARD09 Pkg.pdf .....	10
Response No. CARD 9-5	51415 CARD09 Pkg.pdf .....	11
Response No. CARD 9-6	51415 CARD09 Pkg.pdf .....	12
Attachment 1 to No. CARD 9-6	51415 CARD09 Pkg.pdf .....	13
Response No. CARD 9-7	51415 CARD09 Pkg.pdf .....	14
Response No. CARD 9-8	51415 CARD09 Pkg.pdf .....	15
Response No. CARD 9-9	51415 CARD09 Pkg.pdf .....	16
Attachment 1 to No. CARD 9-9	51415 CARD09 Pkg.pdf .....	17
Response No. CARD 9-10	51415 CARD09 Pkg.pdf .....	18
Attachment 1 to No. CARD 9-10	51415 CARD09 Pkg.pdf .....	19
Response No. CARD 9-11	51415 CARD09 Pkg.pdf .....	20
Response No. CARD 9-12	51415 CARD09 Pkg.pdf .....	21
Attachment 1 to No. CARD 9-12	51415 CARD09 Pkg.pdf .....	22
Response No. CARD 9-13	51415 CARD09 Pkg.pdf .....	23
Attachment 1 to No. CARD 9-13	51415 CARD09 Pkg.pdf .....	24
Response No. CARD 9-14	51415 CARD09 Pkg.pdf .....	25
Attachment 1 to No. CARD 9-14	51415 CARD09 Pkg.pdf .....	26
Response No. CARD 9-15	51415 CARD09 Pkg.pdf .....	27
Response No. CARD 9-16	51415 CARD09 Pkg.pdf .....	28
Response No. CARD 9-17	51415 CARD09 Pkg.pdf .....	29
Attachment 1 to No. CARD 9-17	51415 CARD09 Pkg.pdf .....	30
Response No. CARD 9-18	51415 CARD09 Pkg.pdf .....	31
Attachment 1 to No. CARD 9-18	51415 CARD09 Pkg.pdf .....	32
Attachment 2 to No. CARD 9-18	51415 CARD09 Pkg.pdf .....	33

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**MARCH 29, 2021**

**TABLE OF CONTENTS (Continued)**

<b><u>SECTION</u></b>	<b><u>FILE NAME</u></b>	<b><u>PAGE</u></b>
Attachment 3 to No. CARD 9-18	51415 CARD09 Pkg.pdf .....	57
Response No. CARD 9-19	51415 CARD09 Pkg.pdf .....	72
Attachment 1 to No. CARD 9-19	51415 CARD09 Pkg.pdf .....	73
Response No. CARD 9-20	51415 CARD09 Pkg.pdf .....	76
Attachment 1 to No. CARD 9-20	51415 CARD09 Pkg.pdf .....	77
Response No. CARD 9-21	51415 CARD09 Pkg.pdf .....	78
Attachment 1 to No. CARD 9-21	51415 CARD09 Pkg.pdf .....	79
Response No. CARD 9-22	51415 CARD09 Pkg.pdf .....	80
Attachment 1 to No. CARD 9-22	51415 CARD09 Pkg.pdf .....	81
Response No. CARD 9-23	51415 CARD09 Pkg.pdf .....	82
Attachment 1 to No. CARD 9-23	51415 CARD09 Pkg.pdf .....	83

**Files provided electronically on the PUC Interchange**

 CARD\_9-2\_Attachment\_1  
 CARD\_9-12\_Attachment\_1  
 CARD\_9-13\_Attachment\_1  
 CARD\_9-14\_Attachment\_1  
 CARD\_9-17\_Attachment\_1  
 CARD\_9-19\_Attachment\_1  
 CARD\_9-20\_Attachment\_1  
 CARD\_9-21\_Attachment\_1  
 CARD\_9-22\_Attachment\_1  
 CARD\_9-23\_Attachment\_1

SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-1:**

Reference SWEPCO's response to CARD 1-15, please provide workpapers supporting the proposed adjustments to Test Year non-fuel O&M, rate base, depreciation, taxes and other associated revenue requirements for the referenced retirements at the Knox Lee, Lone Star and Lieberman plants.

**Response No. CARD 9-1:**

Please refer to WP A-3.7 for the workpaper supporting the proposed adjustment to Test Year non-fuel O&M. Information was derived from general ledger detail as shown in the "Data" tab of WP A-3.7. There were no plant level adjustments to rate base, depreciation or taxes for the retirements at Knox Lee, Lone Star and Lieberman plants.

Prepared By: Tiffany A. Powell Day

Title: Regulatory Acctg Case Mgr

Sponsored By: Michael A. Baird

Title: Mng Dir Acctng Policy & Rsrch

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-2:**

Reference SWEPCO's response to CARD 1-15, please provide the retirement date, age at retirement, net dependable capacity, and net book value for each of the referenced retirements at the Knox Lee, Lone Star and Lieberman plants.

**Response No. CARD 9-2:**

See page 9, line 20 through page 10, line 20 of Company witness McMahon's direct testimony, for Knox Lee Units 2-4, Lieberman Unit 2, and Lone Star Unit 1 retirement dates, age at retirement, and MW capacity.

For Lone Star, the net book value at retirement was \$824,826.17.

For Knox Lee and Lieberman, the Company does not track these plants by individual units within its property records and therefore the net book value of each unit at retirement is not available. The Company's accounting treatment of the retired units was performed in accordance with FERC's Code of Federal Regulations, Title 18, Conservation of Power and Water Resources, part 101, Electric Plant Instructions, item 10 Additions and Retirements of Electric Plant, Paragraph B, (2) which states:

"(2) When a retirement unit is retired from electric plant, with or without replacement, the book cost thereof shall be credited to the electric plant account in which it is included, determined in the manner set forth in paragraph D, below. If the retirement unit is of a depreciable class, the book cost of the unit retired and credited to electric plant shall be charged to the accumulated provision for depreciation applicable to such property. The cost of removal and the salvage shall be charged to or credited, as appropriate, to such depreciation account."

Since the net book value of each unit at retirement is not available, the Company can provide the net book value of the Knox Lee and Lieberman Plants in the month prior to retirement (April and May 2020) and the amounts recorded for the retirement for the units at each plant in May 2020. Please see CARD 9-2 Attachment 1.xlsx for this information.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Jason A. Cash

Title: Accounting Sr Mgr

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

Company	Plant	Utility Account	Month	Book Cost	Allocated Reserve	Net Book Value
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31030 - Land - Oil/Gas	04/2020	\$102,781.04	\$0.00	\$102,781.04
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31130 - Struct, Improvemnts-Oil/Gas	04/2020	\$9,077,082.69	\$7,998,297.96	\$1,078,784.73
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31230 - Boiler Plant Equip-Oil/Gas	04/2020	\$32,773,283.15	\$28,308,403.80	\$4,464,879.35
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31430 - Turbogenerator Units-Oil/Gas	04/2020	\$18,087,784.23	\$14,946,587.96	\$3,141,196.27
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31530 - Accssry Elect Equip-Oil/Gas	04/2020	\$4,671,832.42	\$2,952,861.38	\$1,718,971.04
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31630 - Misc Pwr Plt Equip-Oil/Gas	04/2020	\$2,053,745.20	\$1,792,989.52	\$260,755.68
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31730 - ARO Steam Prod Plnt Oil/Gas	04/2020	\$3,294,854.12	\$1,227,467.63	\$2,067,386.49
				<b>\$70,061,362.85</b>	<b>\$57,226,608.25</b>	<b>\$12,834,754.60</b>
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31030 - Land - Oil/Gas	04/2020	\$24,026.38	\$0.00	\$24,026.38
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31130 - Struct, Improvemnts-Oil/Gas	04/2020	\$5,407,423.32	\$3,852,585.24	\$1,554,838.08
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31230 - Boiler Plant Equip-Oil/Gas	04/2020	\$20,004,188.70	\$17,818,352.68	\$2,185,836.02
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31430 - Turbogenerator Units-Oil/Gas	04/2020	\$11,758,614.06	\$11,144,785.62	\$613,828.44
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31530 - Accssry Elect Equip-Oil/Gas	04/2020	\$3,471,047.38	\$2,408,040.87	\$1,063,006.51
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31630 - Misc Pwr Plt Equip-Oil/Gas	04/2020	\$2,320,379.96	\$1,953,042.88	\$367,337.08
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31730 - ARO Steam Prod Plnt Oil/Gas	04/2020	\$1,263,344.24	\$940,324.21	\$323,020.03
				<b>\$44,249,024.04</b>	<b>\$38,117,131.50</b>	<b>\$6,131,892.54</b>

Company	Plant	Utility Account	Month	Book Cost	Allocated Reserve	Net Book Value
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31030 - Land - Oil/Gas	05/2020	\$102,781.04	\$0.00	\$102,781.04
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31130 - Struct, Improvemnts-Oil/Gas	05/2020	\$9,077,082.69	\$8,017,889.34	\$1,059,193.35
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31230 - Boiler Plant Equip-Oil/Gas	05/2020	\$30,017,216.23	\$25,635,089.42	\$4,382,126.81
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31430 - Turbogenerator Units-Oil/Gas	05/2020	\$15,603,354.34	\$12,503,759.95	\$3,099,594.39
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31530 - Accssry Elect Equip-Oil/Gas	05/2020	\$4,671,832.42	\$2,965,631.07	\$1,706,201.35
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31630 - Misc Pwr Plt Equip-Oil/Gas	05/2020	\$2,053,745.20	\$1,800,057.83	\$253,687.37
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31730 - ARO Steam Prod Plnt Oil/Gas	05/2020	\$1,350,801.30	\$490,484.77	\$860,316.53
				<b>\$62,876,813.22</b>	<b>\$51,412,912.38</b>	<b>\$11,463,900.84</b>
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31030 - Land - Oil/Gas	05/2020	\$24,026.38	\$0.00	\$24,026.38
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31130 - Struct, Improvemnts-Oil/Gas	05/2020	\$5,407,423.32	\$3,865,337.74	\$1,542,085.58
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31230 - Boiler Plant Equip-Oil/Gas	05/2020	\$19,394,534.26	\$17,267,210.46	\$2,127,323.80
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31430 - Turbogenerator Units-Oil/Gas	05/2020	\$10,770,200.95	\$10,187,336.85	\$582,864.10
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31530 - Accssry Elect Equip-Oil/Gas	05/2020	\$3,471,047.38	\$2,420,941.60	\$1,050,105.78
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31630 - Misc Pwr Plt Equip-Oil/Gas	05/2020	\$2,320,379.96	\$1,966,907.15	\$353,472.81
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31730 - ARO Steam Prod Plnt Oil/Gas	05/2020	\$1,222,592.12	\$906,158.22	\$316,433.90
				<b>\$42,610,204.37</b>	<b>\$36,613,892.02</b>	<b>\$5,996,312.35</b>

Company	Plant	Utility Account	Month Number	FERC Act Code	Work Order	Activity Cost
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31230 - Boiler Plant Equip-Oil/Gas	202005	Retirement	E10141358	(\$1,418,917.00)
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31230 - Boiler Plant Equip-Oil/Gas	202005	Retirement	E10141367	(\$1,337,149.92)
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31430 - Turbogenator Units-Oil/Gas	202005	Retirement	E10141358	(\$1,286,941.05)
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31430 - Turbogenator Units-Oil/Gas	202005	Retirement	E10141367	(\$1,197,488.84)
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31730 - ARO Steam Prod Plnt Oil/Gas	202005	Retirement	E10141358	(\$968,072.03)
Southwestern Electric Pwr - Gen	Knox Lee Generating Plant	31730 - ARO Steam Prod Plnt Oil/Gas	202005	Retirement	E10141367	(\$975,980.79)
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31230 - Boiler Plant Equip-Oil/Gas	202005	Retirement	E10141217	(\$609,654.39)
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31430 - Turbogenator Units-Oil/Gas	202005	Retirement	E10141217	(\$988,413.11)
Southwestern Electric Pwr - Gen	Lieberman Generating Plant	31730 - ARO Steam Prod Plnt Oil/Gas	202005	Retirement	E10141217	(\$40,752.12)



**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-3:**

Reference SWEPCO's response to CARD 1-15, please provide any economic analysis or other assessment supporting the referenced retirements at the Knox Lee, Lone Star and Lieberman plants.

**Response No. CARD 9-3:**

As shown in CARD 9-3 Attachment 1, Lone Star Unit 1, Lieberman Unit 2, Knox Lee Unit 2 and Knox Lee unit 3 had a variable cost of production well above the AEP Fundamentals Analysis forecast for power prices presented in SWEPCO's most recent IRP, filed with the Louisiana Public Service Commission in Docket No. I-34715 on August 15, 2019.

Furthermore, the units required significant incremental capital investment to sustain safe, reliable operation beyond the announced retirement dates, because of the age and condition of the plant equipment. Additional capital investment was uneconomic because, the units were not expected to generate electricity at a cost lower than the forecasted market price of electricity.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Thomas P. Brice

Title: VP Regulatory & Finance

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

Unit	Forecast 5-Year Average Variable Cost of Production (\$/MWh)	Forecast 5-Year Average SPP Wholesale Electricity Price (Around the Clock, \$/MWh)	Forecast 5-Year Average Peak SPP Wholesale Electricity Price (\$/MWh)	Forecast 5-Year Average Off- Peak SPP Wholesale Electricity Price (\$/MWh)
Lone Star Unit 1	\$46.24	\$23.83	\$27.78	\$18.50
Lieberman Unit 2	\$42.86			
Knox Lee Unit 2	\$51.05			
Knox Lee Unit 3	\$60.20			

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-4:**

Reference SWEPCO's response to CARD 1-17, Attachment 2, Project ARSCP6A17, please provide a copy of the Siemens LTSA and a detailed description of the services provided for the referenced major inspection outage.

**Response No. CARD 9-4:**

See CARD 9-4 Highly Sensitive Attachment 1 for all documents, including a detailed description of the services provided under Project ARSCP6A17, associated with the Stall Plant LTSA.

CARD 9-4 HIGHLY SENSITIVE Attachment responsive to this request is HIGHLY SENSITIVE PROTECTED MATERIAL under the terms of the Protective Order. Due to current restrictions associated with COVID-19, this information is being provided electronically and a secure login to access the information will be provided upon request to individuals who have signed the Protective Order Certification.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-5:**

Reference SWEPCO's response to CARD 1-17, Attachment 2, Project ARSCP6A17, please provide the completion date and amount included in rate base in this case for this project along with any amount included in requested O&M expense for this outage.

**Response No. CARD 9-5:**

See Schedule H-5.2b for the Project ARSCP6A17 completion date and CARD 1-16 Supplemental Attachment 1, for the amount requested for the first time in rates. Since the project was completed prior to the start of the test year, no O&M associated with project ARSCP6A17 is included in the Company's requested amount of test year Generation O&M.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-6:**

Reference SWEPCO's response to CARD 1-17, Attachment 2, Project ARSCP6A17, please provide a breakdown of the total final project costs incurred for this project and identify the portion of total project costs billed by SWEPCO or AEP employees, and the amount charged by Siemens.

**Response No. CARD 9-6:**

See CARD 9-6 Attachment 1, for the requested breakdown of Project ARSCP6A17 costs.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

Stall Plant Unit 6A - Project ARSCP6A17 2017 Major Inspection and Overhaul	
Cost Category	Total
Construction Overheads and AFUDC	\$322,531
Internal Labor	\$8,924
Material & Supplies - Non LTSA	\$100,297
Outside Services - Non LTSA	\$152,322
Siemens LTSA	\$11,531,054
<b>Grand Total</b>	<b>\$12,115,128</b>

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-7:**

Reference SWEPCO's response to CARD 1-17, Attachment 2, Project WSH00DFGD, please provide the in-service date and amount included in rate base in this case for this project.

**Response No. CARD 9-7:**

A project completion date of June of 2018 is shown on row 63 of Schedule H-5.2b. See CARD 1-16 Supplemental Attachment 1, for the amount requested for the first time in rates. See CARD 1-17 Attachment 2, page 74 of 75 for the reference to WSHENVENG as a sub-project of capital program WSH00DFGD. The vast majority of capital investment related to the larger WSH00DFGD Project was placed in service prior to the end of the test year in SWEPCO's prior base rate case, Docket No. 46449, and the Commission found that investment to be prudent in that case.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-8:**

Reference SWEPCO's response to CARD 1-17, Attachment 2, Project WSH00DFGD, please provide the final cost for this project and explain the reasons for any increase from the Total Approved Project Cost provided on the Capital Program Approval Requisition.

**Response No. CARD 9-8:**

The final cost of project WSH00DFGD was \$398.4 million, which is approximately \$42 million less than the total amount provided on the capital program approval requisition. The vast majority of capital investment related to the WSH00DFGD Project was placed in service prior to the end of the test year in SWEPCO's prior base rate case, Docket No. 46449, and the Commission found that investment to be prudent in that case.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO



**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-9:**

Reference SWEPCO's response to CARD 1-17, Attachment 2, Project WSH00DFGD, please provide a breakdown of the total costs incurred for this project, and identify the portion of total project costs billed by SWEPCO or AEP employees, and the amount charged by contractors.

**Response No. CARD 9-9:**

See CARD 9-9 Attachment 1, for the requested breakdown of Project WSH00DFGD costs. The vast majority of capital investment related to the WSH00DFGD Project was placed in service prior to the end of the test year in SWEPCO's prior base rate case, Docket No. 46449, and the Commission found that investment to be prudent in that case.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

Project WSH00DFGD (WSHENVENG) Project Cost Breakdown	
Cost Category	Total
Capital	<b>\$394,932,112</b>
Construction Overheads and AFUDC	\$44,907,307
Internal Labor	\$23,632,144
Material & Supplies	\$81,871,423
Outside Services	\$244,521,237
Removal	<b>\$3,431,468</b>
Construction Overheads and AFUDC	\$283
Internal Labor	\$16,863
Material & Supplies	\$1,571
Outside Services	\$3,412,750
<b>Grand Total</b>	<b>\$398,363,579</b>

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-10:**

Reference SWEPCO's response to CARD 1-17, Attachment 2, Project WSH00DFGD, please provide the cost/benefit analysis supporting this project, along with the gas price forecast, assumed remaining life of the Welsh units, and date of the analysis.

**Response No. CARD 9-10:**

The vast majority of capital investment related to the WSH00DFGD Project was placed in service prior to the end of the test year in SWEPCO's prior base rate case, Docket No. 46449, and the Commission found that investment to be prudent in that case. Please see the direct testimony of SWEPCO witness Mark Becker in Docket No. 46449 for the supporting analysis. Please see CARD 9-10 Attachment 1 for the gas price forecasts used in the analyses. The Welsh units were assumed to continue to run through 2040 in the analyses.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

Henry Hub Gas Price (\$/MMBtu)								
Analysis Forecast Release Date	January 2011 Late 2010		February 2011 - April 2011 January 2011			April 2011 - May 2011 April 2011		
Forecast Name	Reference (Base)	No CO2 Price	Reference Prime	Path B	No CO2 Price	Fleet Transition (Base)	Low Band	Fleet Transition - Carbon Adjusted
2011	4.21	4.81	4.21	4.21	4.81	4.13	4.13	4.13
2012	4.87	5.83	4.87	4.87	5.83	4.19	4.19	4.21
2013	5.14	6.78	5.14	5.14	6.78	4.70	4.70	4.71
2014	5.44	7.02	5.44	5.76	7.02	5.06	5.06	5.06
2015	5.65	7.48	5.65	6.29	7.48	5.20	5.20	5.20
2016	6.06	8.01	6.12	7.01	8.01	5.41	5.41	5.41
2017	6.24	9.09	6.30	7.19	9.09	5.56	5.56	5.44
2018	6.58	9.47	6.64	7.53	9.47	6.07	5.49	5.68
2019	6.84	9.65	6.98	7.79	9.65	6.29	5.59	5.89
2020	7.00	10.02	7.14	7.95	10.02	6.45	5.75	6.06
2021	7.18	10.15	7.40	8.13	10.15	6.68	5.96	6.28
2022	7.28	10.25	7.50	8.23	10.25	6.81	6.12	6.54
2023	7.53	10.00	7.75	8.48	10.00	6.99	6.23	6.73
2024	7.83	9.37	8.07	8.78	9.37	7.22	6.38	6.95
2025	8.00	9.70	8.32	8.95	9.70	7.43	6.55	7.16
2026	8.16	9.94	8.49	9.11	9.94	7.55	6.61	7.25
2027	8.33	10.19	8.66	9.28	10.19	7.71	6.75	7.42
2028	8.50	10.45	8.84	9.45	10.45	7.87	6.89	7.58
2029	8.66	10.71	9.01	9.61	10.71	8.06	7.12	7.75
2030	8.84	10.97	9.19	9.79	10.97	8.16	7.13	7.86
2031	9.02	11.24	9.38	9.97	11.24	8.31	7.25	8.01
2032	9.20	11.52	9.57	10.15	11.52	8.47	7.38	8.16
2033	9.39	11.81	9.76	10.33	11.81	8.63	7.50	8.31
2034	9.58	12.10	9.96	10.52	12.10	8.80	7.63	8.47
2035	9.77	12.41	10.16	10.71	12.41	8.96	7.76	8.63
2036	9.97	12.72	10.37	10.91	12.72	9.13	7.90	8.79
2037	10.17	13.03	10.58	11.11	13.03	9.30	8.03	8.96
2038	10.38	13.36	10.79	11.31	13.36	9.48	8.17	9.13
2039	10.59	13.69	11.01	11.51	13.69	9.66	8.31	9.30
2040	10.80	14.03	11.23	11.72	14.03	9.84	8.45	9.47

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-11:**

Reference SWEPCO's response to CARD 1-17, Attachment 2, Project WSH00DFGD, please provide any cost/benefit analyses conducted to re-evaluate this project considering changes to natural gas prices and SPP market prices from the levels assumed in the original analysis supporting the project.

**Response No. CARD 9-11:**

Please see the response to CARD 9-10.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-12:**

Reference SWEPCO's response to CARD 1-17, Attachment 4, please provide the in-service date and total capital cost requested in rate base in this case for each of the listed transmission capital programs (or Projects).

**Response No. CARD 9-12:**

See CARD 9-12 Attachment 1 for the in-service date and total capital cost requested in rate base in this case for each of the listed transmission capital programs (or Projects).

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Wayman L. Smith

Title: Dir Trans Planning

CPP	CPP_DESC	Capital cost requested in rate base	In-Service Date
TA2016806	TA2016806 SWEPCO - Line Rebuild Program	204,611,709	03/27/2020
TP2009089	TP2009089 Valliant to NW Texarkana 345 k	92,673,383	12/01/2016
TBLANKTSW	TBLANKTSW Trans Capital Blanket - SWEPCo	38,309,881	03/01/2020
TA2018706	TA2018706 SWEPCo Station Proactive Rehab	34,262,289	09/26/2019
TA2015706	TA2015706 Replace/Refurbish - SWEPCo	27,920,634	03/31/2020
TP2013167	TP2013167 T/SWEPCO-TX/Longview Heights -	27,089,097	04/23/2019
TP2015127	TP2015127 Leaside Way	25,827,518	12/11/2019
TP2012106	TP2012106 Welsh HVDC Tie	17,794,561	06/28/2017
TP2009104	TP2009104 Brownlee - North Market 69 kV	16,538,199	04/07/2017
TA2015713	TA2015713 Telecom Fiber Build Out-SWEPCo	15,886,007	01/08/2020
TP2010100	TP2010100 Everside-NW Henderson	11,171,456	05/11/2018
TP2011147	TP2011147 Chamber Springs - Farmington	10,668,801	03/28/2017
TP2016105	TP2016105 Cass Tap to Roach	10,404,960	04/12/2019
TP2014154	TP2014154 Ellerbe Road - Lucas 69 kV	9,628,189	02/27/2019
TA2016924	TA2016924 SWP Region Major Eq/Spares Pro	7,763,206	12/30/2019
TA2013006	TA2013006 2013/2014 Asset Replacement	6,978,060	01/01/2018
TP2013165	TP2013165 Broadmoor - Fort Humbug 69 kV:	6,516,184	06/19/2019
TA2013216	TA2013216 T/SW/Telecom Upgrades	6,495,906	02/01/2019
TP2014139	TP2014139 Linwood-S Shreveport Line	5,577,869	05/10/2018
TP2016082	TP2016082 Chambers Spring Reactor	5,345,007	11/16/2018
TP2016038	TP2016038 East Fayetteville	4,603,461	12/31/2018
TP2018135	TP2018135 Hill Lake	3,927,707	08/28/2019
TP2017010	TP2017010 Siloam- W Siloam 161kV Rebuild	3,797,693	05/31/2019
TA2018806	TA2018806 SWEPCo Region Failure Program	3,323,130	02/26/2020
TP2014138	TP2014138 BROOKS STREET - EDWARDS STREET	2,780,168	12/20/2017
TREESSWEP	TREESSWEP Forestry T&D Widening - SWEPCo	2,737,054	12/31/2019
TP2017221	TP2017221 Hallsville South Tap	2,511,211	12/31/2019
TP2017248	TP2017248 Wedington Tap	2,505,491	05/31/2019
DP14S0003	DP14S0003 SEP/TX/Morton Saline Sub	2,454,821	09/21/2018
TP2013166	TP2013166 Daingerfield- Jenkins Tap	2,385,216	11/09/2017
TP2011033	TP2011033 Messick 500/345/230kV Station	2,258,088	04/29/2016

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-13:**

Reference SWEPCO's response to CARD 1-17, Attachment 4, please identify each of the listed transmission capital programs (or Projects) that were mandated and/or approved by SPP.

**Response No. CARD 9-13:**

See CARD 9-13 Attachment 1 for each of the listed transmission capital programs (or Projects) that were mandated and/or approved by SPP. For TA2016806 SWEPCO - Line Rebuild Program, only a portion of the program was mandated by SPP under NTC #210491.

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Wayman L. Smith

Title: Dir Trans Planning



<b>CPP</b>	<b>CPP_DESC</b>	<b>NTC # or "Not SPP mandated"</b>
<b>DP14S0003</b>	DP14S0003 SEP/TX/Morton Saline Sub	Not SPP Mandated
<b>TA2013006</b>	TA2013006 2013/2014 Asset Replacement	Not SPP Mandated
<b>TA2013216</b>	TA2013216 T/SW/Telecom Upgrades	Not SPP Mandated
<b>TA2015706</b>	TA2015706 Replace/Refurbish - SWEPCo	Not SPP Mandated
<b>TA2015713</b>	TA2015713 Telecom Fiber Build Out-SWEPCo	Not SPP Mandated
<b>TA2016806</b>	TA2016806 SWEPCO - Line Rebuild Program	210491
<b>TA2016924</b>	TA2016924 SWP Region Major Eq/Spares Pro	Not SPP Mandated
<b>TA2018706</b>	TA2018706 SWEPCo Station Proactive Rehab	Not SPP Mandated
<b>TA2018806</b>	TA2018806 SWEPCo Region Failure Program	Not SPP Mandated
<b>TBLANKTSW</b>	TBLANKTSW Trans Capital Blanket - SWEPCo	Not SPP Mandated
<b>TP2009089</b>	TP2009089 Valliant to NW Texarkana 345 k	20096
<b>TP2009104</b>	TP2009104 Brownlee - North Market 69 kV	200216
<b>TP2010100</b>	TP2010100 Evenside-NW Henderson	200216
<b>TP2011033</b>	TP2011033 Messick 500/345/230kV Station	200231
<b>TP2011147</b>	TP2011147 Chamber Springs - Farmington	200216
<b>TP2012106</b>	TP2012106 Welsh HVDC Tie	Not SPP Mandated
<b>TP2013165</b>	TP2013165 Broadmoor - Fort Humbug 69 kV:	200246
<b>TP2013166</b>	TP2013166 Daingerfield- Jenkins Tap	200246
<b>TP2013167</b>	TP2013167 T/SWEPCO-TX/Longview Heights -	200246
<b>TP2014138</b>	TP2014138 BROOKS STREET - EDWARDS STREET	200314
<b>TP2014139</b>	TP2014139 Linwood-S Shreveport Line	200406
<b>TP2014154</b>	TP2014154 Ellerbe Road - Lucas 69 kV	200339
<b>TP2015127</b>	TP2015127 Leaside Way	Not SPP Mandated
<b>TP2016038</b>	TP2016038 East Fayetteville	Not SPP Mandated
<b>TP2016082</b>	TP2016082 Chambers Spring Reactor	Not SPP Mandated
<b>TP2016105</b>	TP2016105 Cass Tap to Roach	Not SPP Mandated
<b>TP2017010</b>	TP2017010 Siloam- W Siloam 161kV Rebuild	200431
<b>TP2017221</b>	TP2017221 Hallsville South Tap	Not SPP Mandated
<b>TP2017248</b>	TP2017248 Wedington Tap	Not SPP Mandated
<b>TP2018135</b>	TP2018135 Hill Lake	Not SPP Mandated
<b>TREESSWEP</b>	TREESSWEP Forestry T&D Widening - SWEPCo	Not SPP Mandated

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-14:**

Reference SWEPCO's response to CARD 1-17, Attachment 4, please provide the original approved cost and final cost at completion of each of the listed transmission capital programs (or Projects).

**Response No. CARD 9-14:**

See CARD 9-14 Attachment 1 for the original approved cost and final cost at completion of each of the listed transmission capital programs (or Projects).

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Wayman L. Smith

Title: Dir Trans Planning

CPP Description	Amount included in rate base prior to this filing	Amount requested in rate base	Estimated Future PIS through 2023	Total of prior rate base, amount requested and estimate to complete project	Estimate or Authorized Amount
TA2016806 SWEPCO - Line Rebuild Program	-	204,611,709.32	84,776,815	289,388,525	294,521,385
TP2009089 Valliant to NW Texarkana 345 k	4,696,970.45	92,673,383.22	-	97,370,354	109,073,584
TBLANKTSW Trans Capital Blanket - SWEPCo	-	38,309,881.26	51,300,000	89,609,881	104,879,991
TA2018706 SWEPCo Station Proactive Rehab	-	34,262,289.38	24,842,655	59,104,944	58,791,739
TA2015706 Replace/Refurbish - SWEPCo	-	27,920,634.09	279,970	28,200,604	28,630,283
TP2013167 T/SWEPCO-TX/Longview Heights -	-	27,089,096.67	-	27,089,097	25,427,249
TP2015127 Leaside Way	-	25,827,517.89	1,353,963	27,181,481	26,209,817
TP2012106 Welsh HVDC Tie	3,360,417.63	17,794,561.00	-	21,154,979	23,835,587
TP2009104 Brownlee - North Market 69 kV	594,405.42	16,538,198.64	-	17,132,604	17,081,175
TA2015713 Telecom Fiber Build Out-SWEPCo	-	15,886,007.32	12,908,046	28,794,053	29,876,620
TP2010100 Everside-NW Henderson	-	11,171,456.22	-	11,171,456	10,973,450
TP2011147 Chamber Springs - Farmington	-	10,668,801.15	-	10,668,801	12,962,227
TP2016105 Cass Tap to Roach	-	10,404,960.01	1,372,628	11,777,588	13,223,558
TP2014154 Ellerbe Road - Lucas 69 kV	-	9,628,189.44	-	9,628,189	8,262,575
TA2016924 SWP Region Major Eq/Spares Pro	-	7,763,206.08	120,000	7,883,206	6,868,926
TA2013006 2013/2014 Asset Replacement	15,836,430.53	6,978,060.27	131,560	22,946,051	22,288,609
TP2013165 Broadmoor - Fort Humbug 69 kV:	-	6,516,183.71	-	6,516,184	6,112,800
TA2013216 T/SW/Telecom Upgrades	5,799,984.40	6,495,905.90	1,916,617	14,212,507	18,772,937
TP2014139 Linwood-S Shreveport Line	-	5,577,868.51	-	5,577,869	6,813,482
TP2016082 Chambers Spring Reactor	-	5,345,007.14	-	5,345,007	4,952,104
TP2016038 East Fayetteville	-	4,603,461.30	-	4,603,461	7,132,308
TP2018135 Hill Lake	-	3,927,707.37	45,945	3,973,652	5,347,624
TP2017010 Siloam- W Siloam 161kV Rebuild	-	3,797,693.41	-	3,797,693	4,781,058
TA2018806 SWEPCo Region Failure Program	-	3,323,130.22	9,375,000	12,698,130	13,632,500
TP2014138 BROOKS STREET - EDWARDS STREET	-	2,780,167.88	-	2,780,168	3,445,601
TREESSWEP Forestry T&D Widening - SWEPCo	-	2,737,054.39	3,413,146	6,150,200	9,590,560
TP2017221 Hallsville South Tap	-	2,511,211.07	188,860	2,700,071	3,030,756
TP2017248 Wedington Tap	-	2,505,491.40	-	2,505,491	2,779,200
DP14S0003 SEP/TX/Morton Saline Sub	-	2,454,820.76	-	2,454,821	2,785,335
TP2013166 Daingerfield- Jenkins Tap	-	2,385,215.90	-	2,385,216	2,186,836
TP2011033 Messick 500/345/230kV Station	56,391,792.71	2,258,087.96	-	58,649,881	56,826,700

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-15:**

Reference SWEPCO's response to CARD 1-17, Attachment 4, please identify each of the listed transmission capital programs (or Projects) whose costs are funded by other members of SPP, and provide the adjustments proposed in this case to reflect such third-party funding for each project.

**Response No. CARD 9-15:**

None of the capital costs associated with the projects identified in SWEPCO's response to CARD 1-17, Attachment 4 were funded by a Third Party.

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Wayman L. Smith

Title: Dir Trans Planning

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-16:**

Reference SWEPCO's response to CARD 1-17, Attachment 4, please identify each of the listed transmission capital programs (or Projects) that have been approved by the FERC and provide copies of the FERC orders that approved such projects.

**Response No. CARD 9-16:**

Please also see the Company's response to CARD 9-15. FERC does not approve specific capital programs or projects, it instead approves the development of the revenue requirements or rates designed to compensate transmission owners for the cost associated with projects used to provide services under the SPP Tariff.

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Wayman L. Smith

Title: Dir Trans Planning

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-17:**

Reference SWEPCO's response to CARD 1-17, Attachment 4, page 1, SWEPCO Line Rebuild Program, please provide the in-service dates and total capital cost requested in rate base in this case for each of the listed rebuilt lines included in this program.

**Response No. CARD 9-17:**

See CARD 9-17 Attachment 1 for the in-service dates and total capital cost requested in rate base in this case for each of the listed rebuilt lines included in this program.

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Wayman L. Smith

Title: Dir Trans Planning

Line Rebuild Project	In Service Date	Rate Base Request
Arsenal Hill to Longwood 138 kV (16.3 miles)	12/19/2019	18,780,080.15
Bann to Sugar Hill 69 kV (1.1 miles)	12/14/2019	4,334,280.99
Clarendon to Northwest Memphis 69 kV (25.2 miles)	07/11/2019	21,157,865.38
Greenland to Van Buren Interconnect (VBI) North 69 kV (36.8 miles)	12/14/2018	32,392,686.08
Hughes Springs to Jenkins Tap 69 kV (4.8 miles)	03/23/2018	6,698,736.74
Jenkins Tap to Lone Star Power Plant 69 kV (9.0 miles)	12/05/2019	17,695,711.60
Mt. Pleasant to New Boston 69 kV (42.1 miles)	03/11/2020	49,687,099.49
North Huntington to Waldron West 69 kV (18.7 miles)	05/22/2018	15,829,405.16
Northwest Memphis to West Childress 69 kV (33.3 miles)	07/30/2019	24,136,573.06

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-18:**

Reference SWEPCO's response to CARD 1-17, Attachment 4, page 1, SWEPCO Line Rebuild Program, please provide the cost/benefit analyses and other information provided to Company management to support final approval of each of the listed rebuilt lines listed in this program.

**Response No. CARD 9-18:**

See CARD 9-18 Attachments 1 through 3 for the analyses and other information provided to Company management to support final approval of each of the rebuilt lines listed in this program.

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Wayman L. Smith

Title: Dir Trans Planning



# SWEPCO Line Rebuild (TA2016806)

Cl	Line name	Line Length (miles)	Age	Rank	Momentary/Permanent Operations 2013-2015 <sup>1</sup>	Authorized Amount (\$ in millions)	Description
TA1680614	SWEPCO-N Huntington-Waldron W	19	1960	2nd	8	\$ 17	Old Line - Full Rebuild. Storm Damage causes multiple outages per year. Broken cross arms and Insulators. Line out for over 200 hours since 2013 for equipment failures. Serves 35 MW.
TA1680617	SWEPCO: NW Memphis-W Childress	35	1930	5th	22	\$ 33	Old Line - Full Rebuild. Storm damage causes multiple outages per year. Old switches at taps need replaced. Multiple issues with broken and rotted cross arms and poles, broken and contaminated insulators, and woodpecker damage.
TA1680609	BANN-SUGARHILL-39TH STREET	11	1970	7th	7	\$ 22	Full rebuild, unless concrete poles can handle new conductor. Old wooden pole construction except for a few concrete poles. Damaged shield wire and guy wire issues. Multiple storm outages. Rotting poles. Serves 80 MW of load. (Intensive outreach due to location of lines)
TA1680603	DNGR FLD-LONE STAR PP	12	1960	8th	23	\$ 19	Full rebuild including the Daingerfield - Jenkins T section that we have an NTC for from SPP. Old line with multiple cross arm failures and rotting poles. Jenkins REC tap switches location in a flood plain.
TA1680601	ARSENAL HILL-LONGWOOD	16	1990	9th	6	\$ 15	Although from the 90's all structures are wood and in bad shape due to "bending". Multiple H-Frames have failed in the past. Line serves 22 MW of D load.
TA1680616	SWEPCO: Clarendon-NW Memphis	26	1940	11th	14	\$ 25	Old Line - Full Rebuild. Storm damage causes multiple outages per year. Old Conductor has failed several times and had to be spliced. Old switches at taps need replaced. Issues with cross arms rotting and broken.
TA1680615	SWEPCO: Mt Pleasant-New Boston	42	1950	13th	32	\$ 41	Old Line - Full Rebuild - 34 miles with large amount of exposure - old poles - H Frame - REAs: Cookeville, Buford, Naples
TA1680618	SWEPCO: Pilgrims Pride-W Mt PI	9	1960	18th	18	\$ 11	Old Line - Full Rebuild - Constant failing
TA1680602	HUGHES SPRINGS-LONE STAR SOUTH	8	1950	19th	10	\$ 8	Multiple Cross arm failures.
TA1680608	GREENLAND-VBI NORTH	13	1930	75th	19	\$ 35	North VBI Strickler Tap is in terrible condition; major reliability issue soon. Poles and cross arms are extremely bad condition.

All lines in this program are ranked in the top 20 as the worst performing lines, except one which is a 1930's deteriorated line.

<sup>1</sup> The amount of times the line was out of service due to a momentary fault (less than 5 minutes) or permanent fault (beyond 5 minutes)



# **SWEPCo Line Rebuild Program**

**Operating Company: SWEPCo**

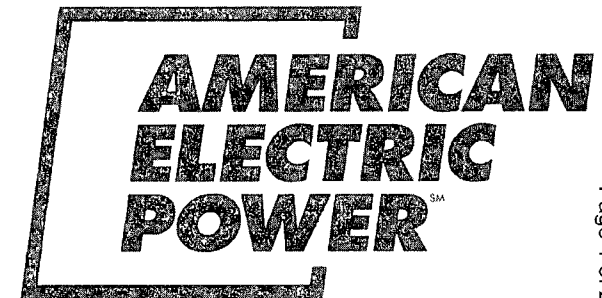
**Project Type: DRETH**  
**Project Category: Local Reliability/Resiliency**  
**Project Location: LA,TX & AR**  
**Estimated Total Cost: \$306M**  
**Estimated Trans Cost: \$306M**  
**Estimate Type: Class 3**  
**Current Status: Construction/In-Service**  
**Projected ISD: 1/13/2023**  
**Project Number(s):TA2016806**  
**PLMP Risk Level: Medium**  
**Master Project: Multiple**  
**EPC: Yes**

**Project Sponsors : Jorge Ramos/Jomar Perez, TAPR**

**Project Manager: SPP PM Team (Various)**

**Revision Date: 12/26/2019**

**Revision Number: 1**



**BOUNDLESS ENERGY**

- TA2016806 was authorized originally on 12/29/2016 for \$226M (ten line projects identified, Class 5 estimates +100%/-50%) to address 222 miles of aging transmission line assets in poor condition and with poor performance.
- This revision asks for an additional \$80M to cover incremental costs caused by some of the projects originally included in this requisition as well as associated station work.
- The EAC forecast for the entire CPP is approximately \$300M. There is \$60M of remaining investment left for 2020-2023. A 10% contingency as per Estimating Guidelines for detailed estimates (class 3) is part of this revision but was only applied to the remaining investment figure.
- On average, cost per mile was approximately \$1.22M based on miles being rebuild and EAC loaded figures which is significantly higher than the original \$1.01M cost per mile estimated with the original requisition.
- 10 lines and associated station work were addressed with this requisition.

- **Station Work**
  - The switches and stations served from these lines housed obsolete equipment with high risk of failure that needed to be replaced. Equipment included line switches, oil circuit breakers, bus work and electromechanical relays that directly affected the terminals of the transmission lines. In some cases, the new line rating would've been limited by such equipment had it not been included in the scope. The types of obsolete equipment included for replacement have limited spare parts in inventory, lack vendor support and have historically high failure rates across all the AEP regions.
- **Bann-39<sup>th</sup> Street-Sugar Hill 69kV Line Project**
  - The line was scoped to be rebuilt at 138kV due to load growth in the area. With the existing conductor, the line saw loadings of 125% above it's emergency rating under the worst-case contingency.
  - The subject line passes through the City of Texarkana and through heavily populated and congested commercial and residential areas as well as highway, railroad crossings and ponds.
  - There was approximately 6 miles of distribution underbuild that needed to be transferred to new structures that was not included in the original estimate.
- **Arsenal Hill-Longwood 138kV Line Project**
  - Much of the existing ROW is located in wetlands, as such a very high amount of matting was required by the COE for construction purposes.
- **Mount Pleasant-New Boston 69kV Line Project**
  - The line crossed several ponds, creeks and wetlands which increased ROW costs and required additional matting for construction purposes.
- **Daingerfield-Lone Star Power Plant-Hughes Springs 69kV Line Project**
  - A new switch station (Bruton) was added to eliminate a three terminal line configuration and to reduce the exposure of customers served from the circuit.
- **All Line Projects**
  - On average, the majority of the line projects were underestimated as referenced in the \$1.22M per mile actual cost versus the originally estimated \$1.01M per mile cost.

			2014-2019	
Circuits	Voltage	Original Install Date	Forced Outage Count Permanent (Momentary)	Outage Duration (Total Hrs)
39 <sup>th</sup> Street-Bann-Sugar Hill	69kV	1941	9 (4)	90
Arsenal Hill-Longwood	138kV	1931	2 (4)	75
Daingerfield-Hughes Springs-Lone Star PP	69kV	1966	14 (23)	5,514
Greenland-VBI North	69kV	1938	7 (72)	130
Hughes Springs-Lone Star South	69kV	1955	10 (7)	2,656
Mount Pleasant-New Boston	69kV	1949	16 (19)	10,308
North Huntington-Waldron	69kV	1969	12 (37)	144
NW Memphis-Clarendon	69kV	1930s	7 (14)	84
NW Memphis-Childress	69kV	1931	11 (41)	167
Pilgrims Pride-West Mount Pleasant-Winfield	69kV	1930	11 (26)	86
		Totals	99 (247)	19,254

- The above table lists the circuits that will be addressed under this requisition and provides a count and duration of forced outages in the last 5 years as well as their original install date.
- These assets range from 50 to 90 years old.
- From 2013-2016, these circuits accumulated approximately 3.9M of CMI that affected customer reliability.



# Appendix

# 39<sup>th</sup> Street-Bann-Sugar Hill

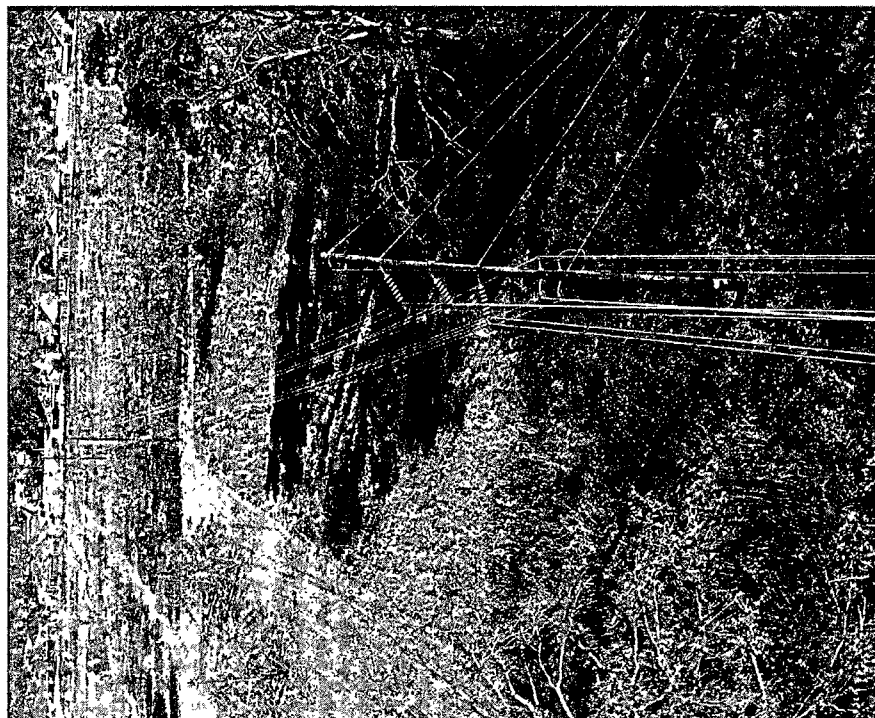
Line Characteristics								
TOR ID	Circuit	Voltage	Length	State	Shielding Length	Shielding (%)	Avg. Structure Height	Associated Line Assets
6428	39th Street - Bann - Sugar Hill	69kV	11.53	TX	12.53	108%	69.4	Bann-North New Boston, Bann-39 <sup>th</sup> street, Northwest Texarkana-Sugar Hill(AR), Northwest Texarkana-Sugar Hill (TX), Sugar Hill West Tap

Structure Characteristics			
Length	Year	Str Count	Material
4.2114	1973	69	Wood
1.7060	1952	26	Wood
1.4683	1941	27	Wood
1.1629	1978	11	Wood
0.6381	1967	11	Wood

Open Conditions				
Associated Line Assets	Severity	Component	Condition	Condition Count
Bann-North New Boston	-	Forestry	Forestry	4
Bann-39 <sup>th</sup> Street	A1	Pole/Insulator	Structure	4
	A2	Crossarm/Guy Anchor	Structure	46
	B	Ground Lead/Insulator	Structure	11
Northwest Texarkana-Sugarhill (AR)	A2	Crossarm/Clamp/Pole	Structure	13
	B	Ground Lead/Crossing/Pole	Structure	19
Northwest Texarkana-Sugar Hill (TX)	A2	Pole/Insulator/Clamp	Structure	9

Performance Totals
CMI: 1,138,186
CI: 10,550
Peak Load Impact: 83.346 MVA

( 6 )





# Arsenal Hill-Longwood

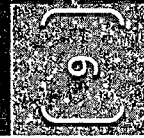
Line Characteristics								
TOR ID	Circuit	Voltage	Length	State	Shielding Length	Shielding (%)	Avg. Structure Height	Associated Line Assets
6444	Arsenal Hill - Longwood	138kV	16.45	LA	32.79	198%	80	Arsenal Hill-Lieberman, Arsenal Hill-Longwood

Structure Characteristics			
Length	Year	Str Count	Material
14.2862	1991*	134	Wood
0.6562	1991	7	Lattice
0.4609	1991	4	Wood
0.4607	1991	4	Steel
0.3481	1991	3	Wood

\* Property records indicate line was originally built in 1931.

Open Conditions				
Associated Line Assets	Severity	Component	Condition	Condition Count
Arsenal Hill-Longwood	A1	Pole	Structure	1
	A1	Conductor	Conductor	2
	A2	Crossarm/Guys/Knee/Vee Brace/Pole	Structure	25
	A3	Access Road	ROW	1

Performance Totals
CMI: 759,196
CI: 11,524
Peak Load Impact: 25.765 MVA



# Hughes Spring-Daingerfield-Lone Star PP

Line Characteristics								
TOR ID	Circuit	Voltage	Length	State	Shielding Length	Shielding (%)	Avg. Structure Height	Associated Line Assets
6548	Hughes Springs - Daingerfield - Lone Star PP	69kV	15.69	TX	15.55	99%	58.9	Air Products Tap (E), Air Products Tap (W), Daingerfield-Hughes Springs, Jenkins Rec Tap, Lone Star Steel Mill Tap

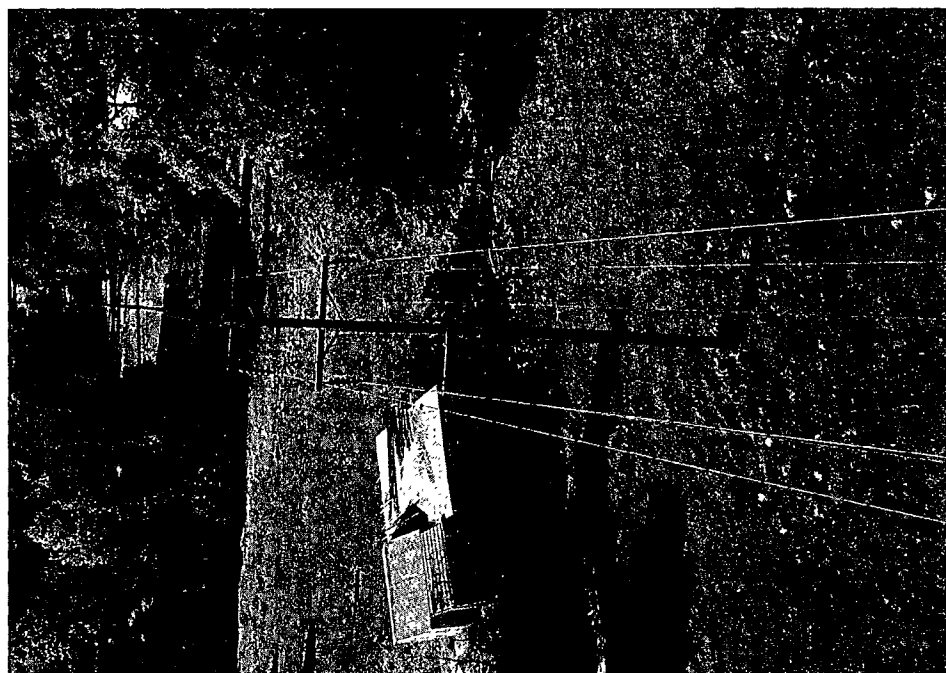
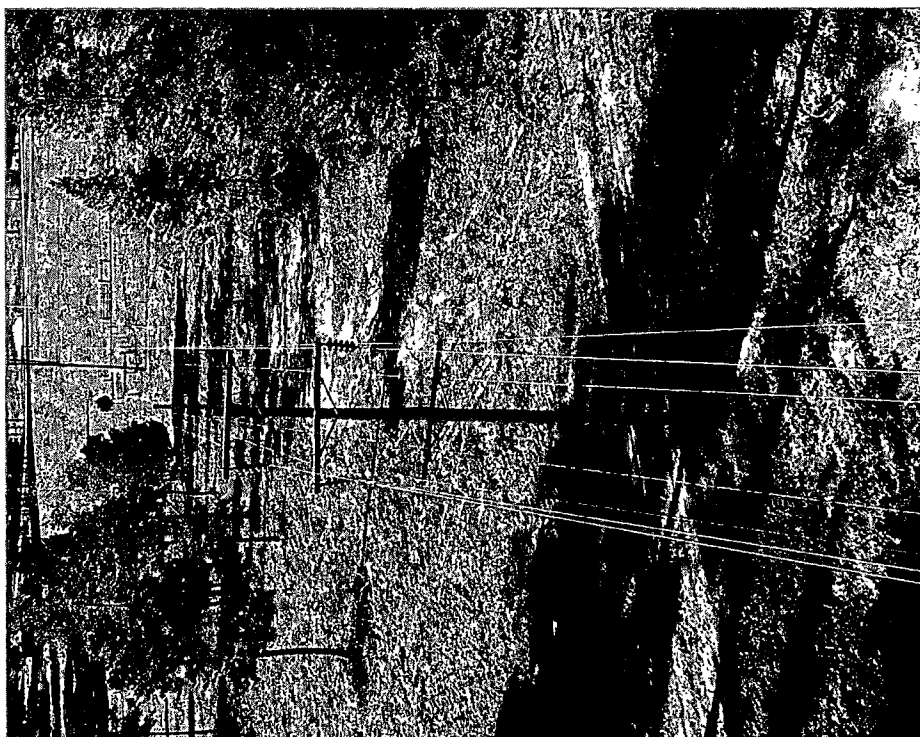
Structure Characteristics			
Length	Year	Str Count	Material
6.790	1968	100	Wood
6.115	1966	108	Wood
1.052	1977	19	Wood
0.571	1979	10	Wood
0.554	1976	11	Wood

Open Conditions				
Associated Line Assets	Severity	Component	Condition	Condition Count
Daingerfield-Hughes Spring	A1	Crossarm/Pole/Knee/Vee Brace	Structure	6
	A2	Pole/Insulator/Knee/Vee Brace/Insulator	Structure	18
	A3	Pole	Structure	7

Performance Totals
CMI: 275,704
CI: 4,212
Peak Load Impact: 18.519 MVA

( 10 )

(11)



# Greenland-North VBI (OGE)

Line Characteristics								
TOR ID	Circuit	Voltage	Length	State	Shielding Length	Shielding (%)	Avg. Structure Height	Associated Line Assets
6629	Greenland - North VBI (OGE)	69kV	45.20	AR	12.18	27%	52.6	Greenland-VBI North (AECC), Sefor Tap

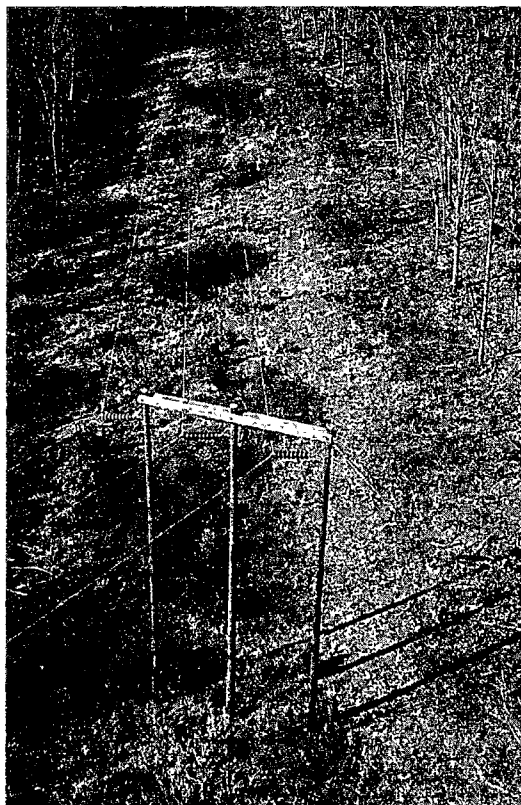
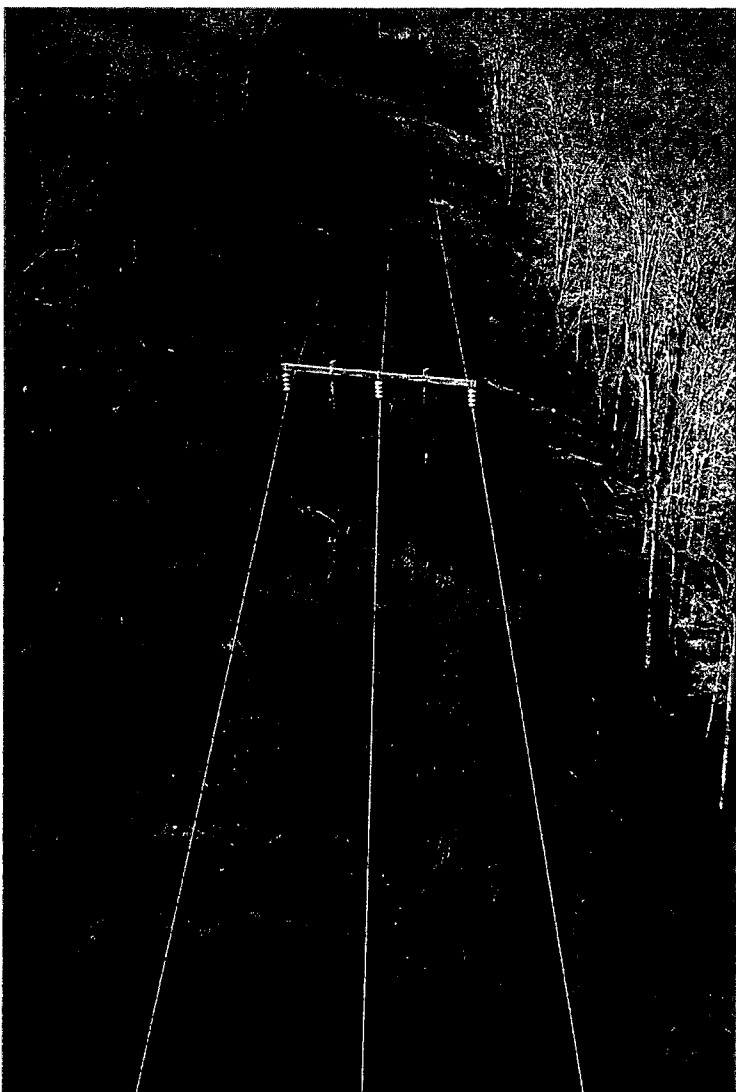
Structure Characteristics			
Length	Year	Str Count	Material
30.402	1938	273	Wood
9.426	1938	75	Wood
3.218	1964	44	Wood
0.945	1953	10	Wood
0.653	1968	9	Wood

Open Conditions				
Associated Line Assets	Severity	Component	Condition	Condition Count
Greenland-VBI North (AECC)	A1	Pole/Insulator/Crossarm	Structure	16
	A2	Crossing/Pole/Guys/Crossarm	Structure	65
	A3	Pole/Crossarm/Insulator	Structure	37
Sefor Tap	A3	Pole	Structure	11

Performance Totals
Peak Load Impact: 7.77 MVA

( 12 )

# Greenland-North VBI (OGE)



( 13 )

# Hughes Springs-Lone Star South

Line Characteristics								
TOR ID	Circuit	Voltage	Length	State	Shielding Length	Shielding (%)	Avg. Structure Height	Associated Line Assets
6703	Hughes Springs - Lone Star South	69kV	8.26	TX	8.51	103%	60.3	Hughes Springs-Lone Star South

Structure Characteristics			
Length	Year	Str Count	Material
3.785	1972	59	Wood
2.784	1970	40	Wood
0.749	1955	11	Wood
0.331	1973	6	Wood
0.330	1982	3	Wood

Open Conditions				
Associated Line Assets	Severity	Component	Condition	Condition Count
Hughes Spring-Lone Star South	A1	Shield Wire	Conductor	1
	A1	Crossarm	Structure	1
	A2	Pole/Crossarm/Insulator	Structure	6

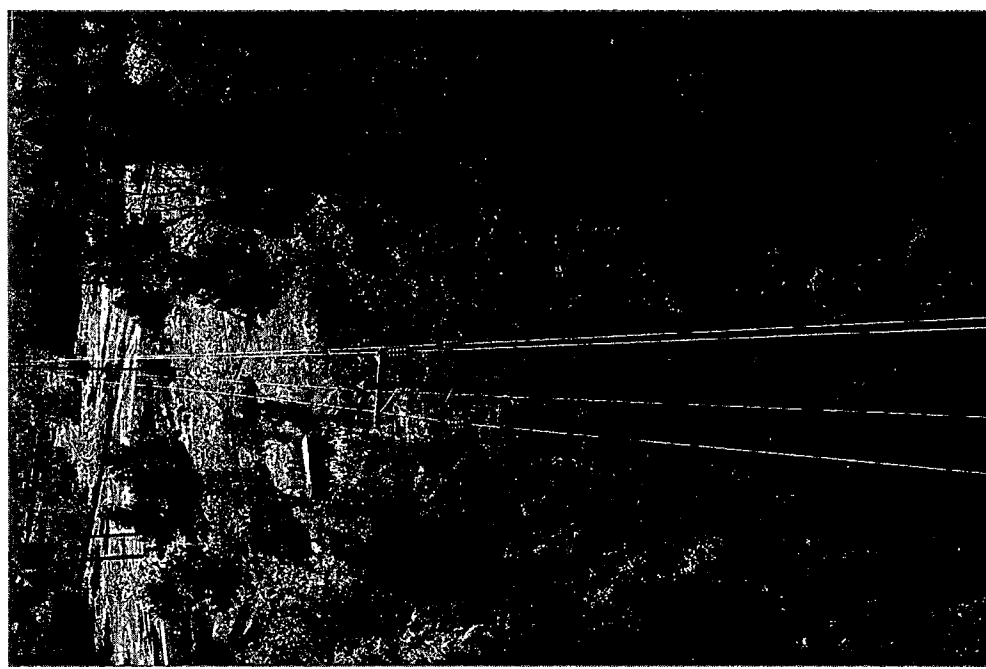
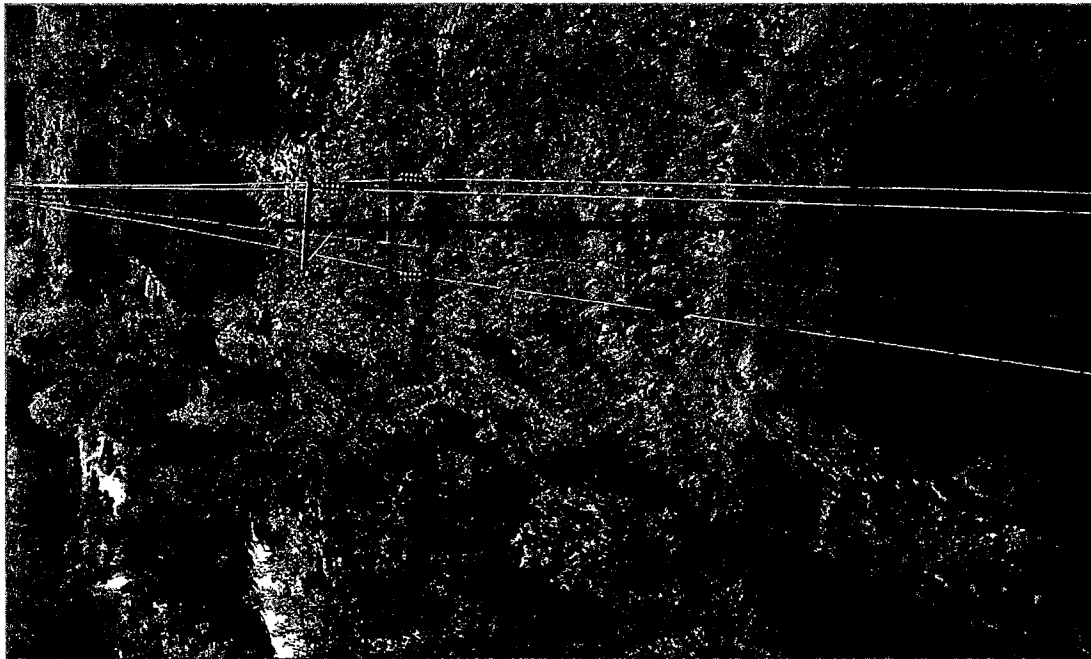
Historical Permanent Outage Data						
Outage Cause Review (2013-2016 YTD)						
Permanent Outage Count	Durations (average)	T-Line (Duration)	Station (Duration)	Veg (AEP) (Duration)	Veg (None-AEP) (Duration)	External Factors (Duration)
5	520.32	1%	0%	0%	99%	0%
		T-Line (Frequency)	Station (Frequency)	Veg (AEP) (Frequency)	Veg (None-AEP) (Frequency)	External Factors (Frequency)
		60%	0%	0%	40%	0%

Performance Totals
Peak Load Impact: 10.4 MVA

( 14 )

(15)

# Hughes Springs-Lone Star South





# Mount Pleasant-New Boston

Line Characteristics								
TOR ID	Circuit	Voltage	Length	State	Shielding Length	Shielding (%)	Avg. Structure Height	Associated Line Assets
6730	Mount Pleasant - New Boston	69kV	55.855	TX	87.028	156%	57.3	Buford-Naples, Cookville Tap, Mount Pleasant-New Boston

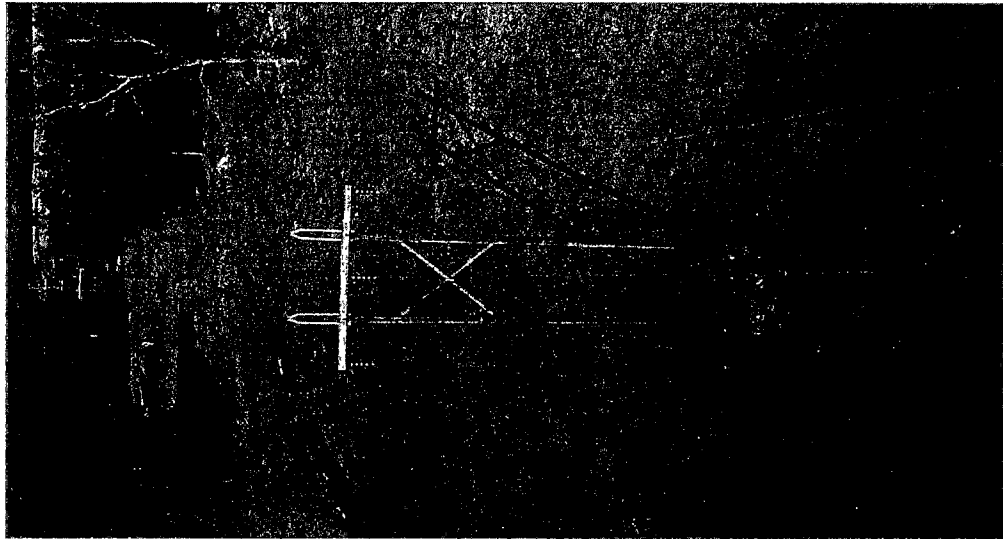
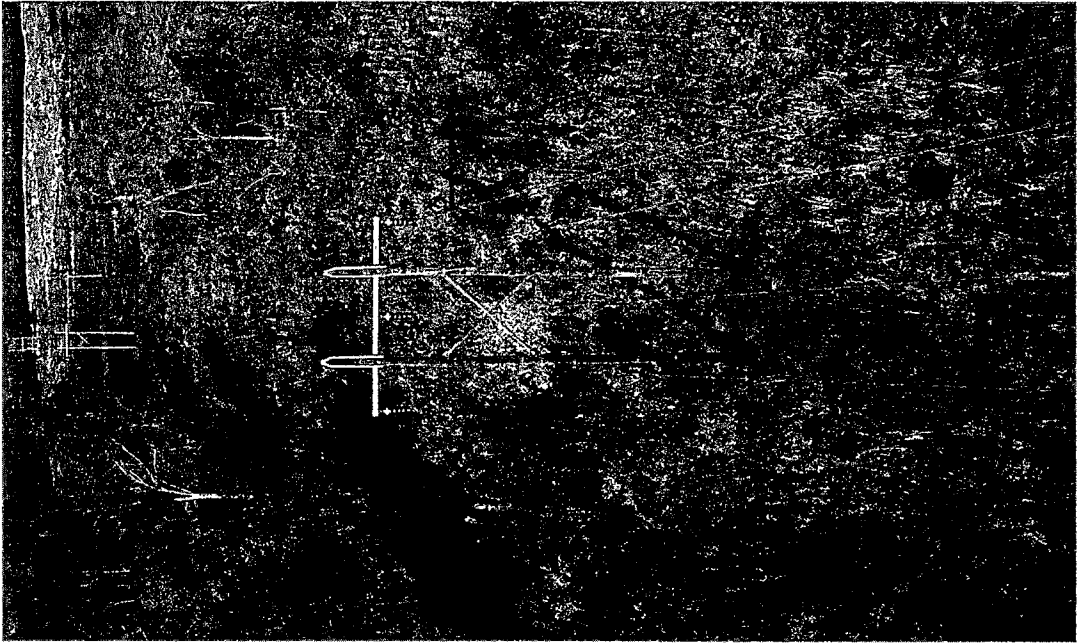
Structure Characteristics			
Length	Year	Str Count	Material
33.107	1951	277	Wood
11.017	1949	173	Wood
6.429	1971	98	Wood
1.939	1968	29	Wood
1.027	1985	17	Wood

Open Conditions				
Associated Line Assets	Severity	Component	Condition	Condition Count
Mount Pleasant-New Boston	A1	Pole/Crossarm	Structure	28
	A2	Pole/Guy Anchor/Guy Wire/Crossarm	Structure	53
	A3	Pole/Crossarm/Insulator	Structure	5
Buford-Naples	A1	Pole/Crossarm	Structure	2
	A2	Crossarm/Pole/Insulator	Structure	15
	-	Forestry	Forestry	33

Performance Totals
CMI: 587,660
CI: 3,850
Peak Load Impact: 18.728 MVA

( 16 )

# Mount Pleasant-New Boston



(17)

# North Huntington-Waldron

Line Characteristics								
TOR ID	Circuit	Voltage	Length	State	Shielding Length	Shielding (%)	Avg. Structure Height	Associated Line Assets
6741	North Huntington-Waldron	69 kV	18.55	AR	18.801	101%	56.7	North Huntington CBs 11730 & 1120 (Radial Load)

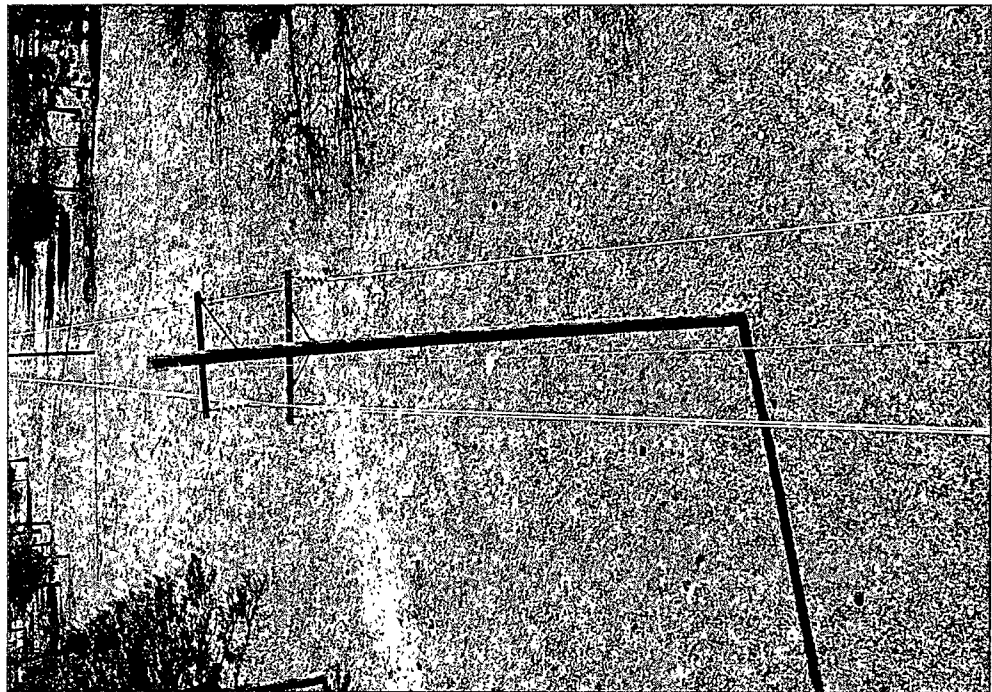
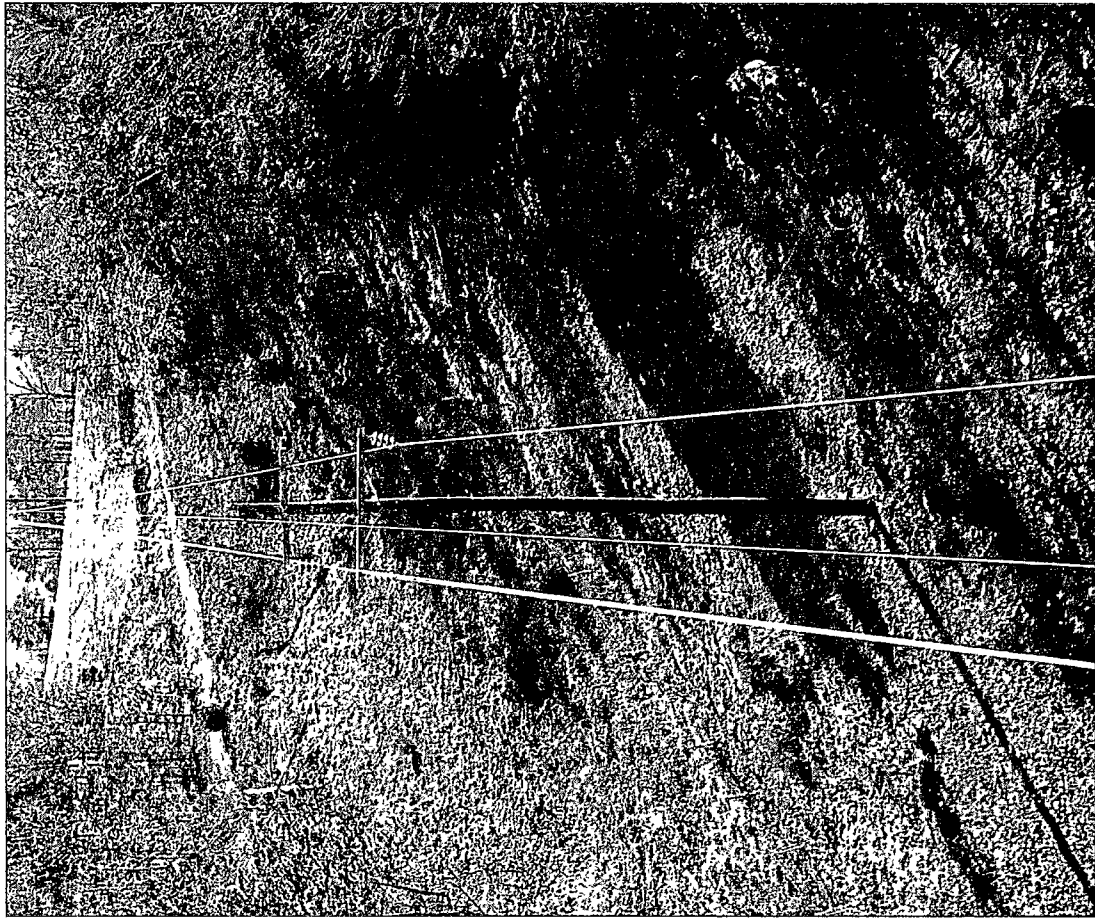
Structure Characteristics			
Length	Year	Str Count	Material
17.900	1969	276	Wood
0.165	1970	3	Wood
0.148	2009	4	Steel
0.092	1977	2	Wood
0.090	1982	4	Wood

Open Conditions				
Associated Line Assets	Severity	Component	Condition	Condition Count
North Huntington-Waldron	A1	Pole/Crossarm	Structure	9
	A1	Shield Wire	Conductor	1
	A2	Crossarm/Pole/Guys/Insulator	Structure	13
	A3	Crossarm	Structure	2

Performance Totals
CMI: 257,193
CI: 9,195
Peak Load Impact: 35.727 MVA

( 18 )

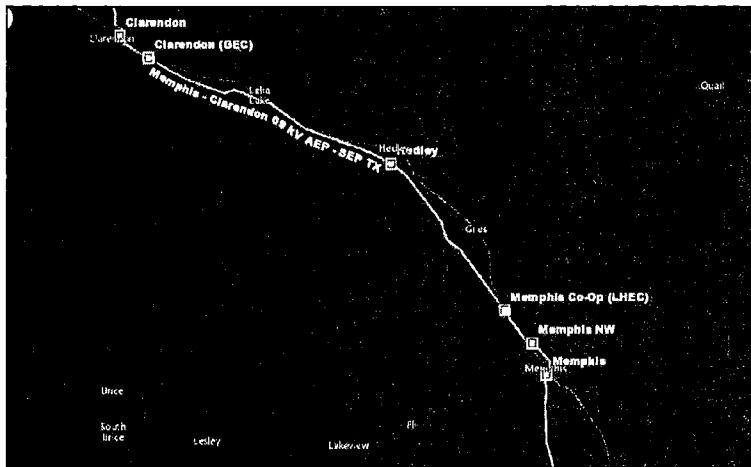
[ 19 ]



# NW. Memphis-Clarendon

Circuit Characteristics								
TOR ID	Circuit	Voltage	Length	State	Shielding Length	Shielding (%)	Avg. Structure Height	Associated Line Assets
7751	Northwest Memphis – Clarendon	69kV	25.27	TX	-	-	-	NW. Memphis-Clarendon

Open Conditions				
Associated Line Assets	Severity	Component	Condition	Condition Count
Memphis-Clarendon	A1	Pole/Crossarm/Knee/Vee Brace	Structure	25
	B	Pole/Crossarm/Insulator	Structure	34



Performance Totals
CMI: 581,409
CI: 4,149
Peak Load Impact: 1.51 MVA

( 20 )

# NW. Memphis-W. Childress

Circuit Characteristics								
TOR ID	Circuit	Voltage	Length	State	Shielding Length	Shielding (%)	Avg. Structure Height	Associated Line Assets
7570	Northwest Memphis - West Childress	69kV	32.26	TX	33.27	96%	51.1	Estelline-Memphis, Memphis-Clarendon, W. Childress-Estelline

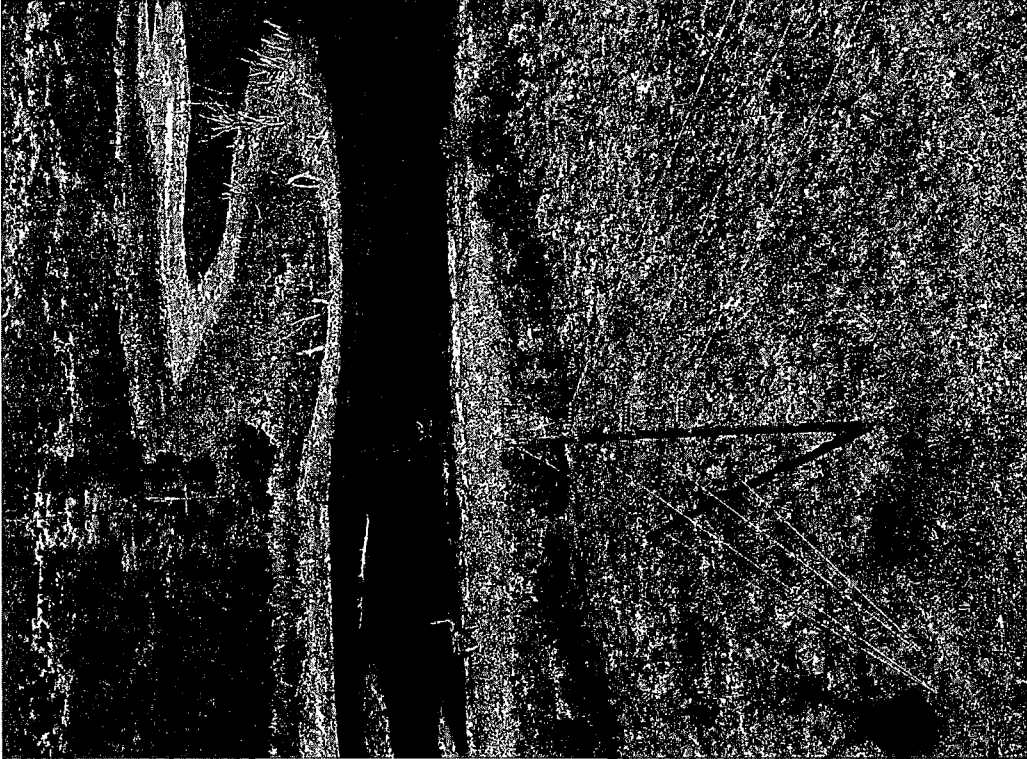
Open Conditions				
Associated Line Assets	Severity	Component	Condition	Condition Count
Estelline-Memphis	A1	Structure/Crossarm/Knee/Vee	Structure	10
	A2	Pole/Crossarm/Insulator/Knee/Vee	Structure	28
	A3	Crossarm/Knee/Vee	Structure	6
W. Childress-Estelline	A1	Pole/Crossarm/Knee/Vee	Structure	45
	A2	Insulator/Knee/Vee Brace	Structure	9
	B	Pole/Ground Lead Wire/Crossarm	Structure	24
Memphis-Clarendon	A1	Pole/Crossarm/Knee/Vee Brace	Structure	25
	B	Pole/Crossarm/Insulator	Structure	34

Circuit Structure Characteristics			
Length	Year	Str Count	Material
19.14	1931	286	Wood
7.19	1942	130	Wood
1.78	1931	35	Wood
0.83	1931	12	Lattice
0.83	1969	12	Lattice
0.43	1957	3	Wood
0.30	1955	5	Wood
0.27	1931	2	Lattice
0.26	1956	4	Wood

( 21 )



( 22 )



# Pilgrims Pride-West Mount Pleasant-Winfield

Line Characteristics								
TOR ID	Circuit	Voltage	Length	State	Shielding Length	Shielding (%)	Avg. Structure Height	Associated Line Assets
6781	Pilgrims Pride - West Mount Pleasant - Winfield	69kV	17.89	TX	18.82	99%	65.1	Adora Tap, Pilgrims Pride-Winfield, Winfield-Mount Vernon, Winfield-Winnsboro

Structure Characteristics			
Length	Year	Str Count	Material
6.6933	1964	118	Wood
2.4780	1972	38	Wood
2.3827	1979	45	Wood
1.3528	1930	28	Wood
1.0507	1982	19	Wood

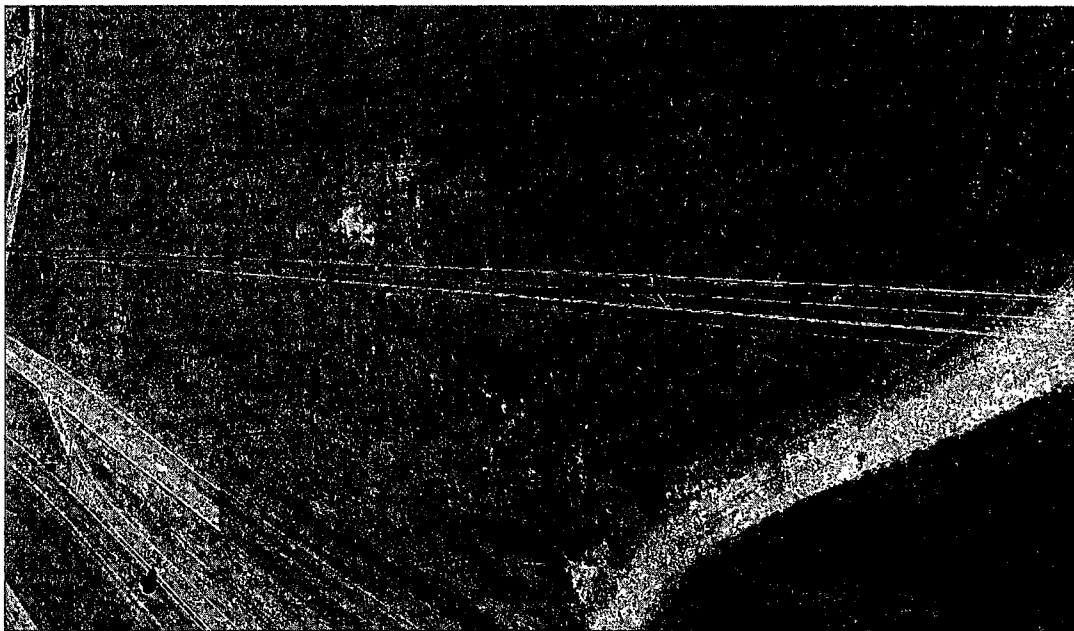
Open Conditions				
Associated Line Assets	Severity	Component	Condition	Condition Count
Pilgrims Pride-Winfield	A1	Insulator/Crossarm	Structure	4
	A2	Crossing/Insulator/Pole	Structure	20
	A3	Molding	Structure	1
Winfield-Mount Vernon	A1	Pole/Guy Anchor/Guys	Structure	5
	A1	Shield Wire	Conductor	4
	A2	Crossing/Insulator/Crossarm	Structure	4
Winfield-Winnsboro	A1	Splice/Pole/Crossarm	Structure	8
	A2	Pole/Crossarm/Switcharm/Guys	Structure	24

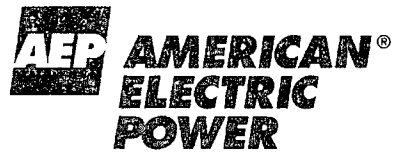
Performance Totals
CMI: 256,358
CI: 9310
Peak Load Impact: 25.011 MVA

( 23 )



[ 24 ]





# **AEP Transmission Planning Criteria and Guidelines for End-Of-Life and Other Asset Management Needs**

December 2020

## Document Control

### Document Review and Approval

Action	Name(s)	Title
Prepared by:	Jomar M. Perez	Manager, Asset Performance and Renewal
Approved by:	Nicolas Koehler	Director, East Transmission Planning
Approved by:	Wayman L. Smith	Director, West Transmission Planning
Approved by:	Kamran Ali	Managing Director, Transmission Planning

### Review Cycle

Quarterly	Semi-annual	Annual	As Needed X
-----------	-------------	--------	----------------

### Revision History

Version	Revision Date	Changes	Comments
1.0	01/04/2017	N/A	1 <sup>st</sup> Release
2.0	1/18/2018	Format Update	2 <sup>nd</sup> Release
3.0	11/09/2018	Content Additions	3 <sup>rd</sup> Release
4.0	12/14/2020	End-Of-Life Criteria	4 <sup>th</sup> Release

## Table of Contents

1.0	Introduction .....	4
2.0	Process Overview .....	6
3.1	Methodology and Process Overview .....	8
3.2	Asset Condition (Factor 1) .....	8
3.2.1	Transmission Line Considerations.....	9
3.2.2	Substation Considerations .....	10
3.3	Historical Performance (Factor 2).....	11
3.4	Future Risk (Factor 3).....	12
4.0	Step 2: Solution Development .....	14
5.0	Step 3: Solution Scheduling .....	14
6.0	Conclusion.....	15
7.0	References .....	15

## **1.0 Introduction**

The American Electric Power (AEP) transmission system consists today of approximately 40,000 miles of transmission lines, 3,600 stations, 5,000 power transformers, 8,000 circuit breakers, and operating voltages between 23 kV and 765 kV in three different RTOs – the Electric Reliability Council of Texas (ERCOT), the PJM Interconnection (PJM), and the Southwest Power Pool (SPP), connecting over 30 different electric utilities while providing service to over 5.4 million customers in 11 different states.

AEP's interconnected transmission system was established in 1911 and is comprised of a very large and diverse combination of line, station, and telecommunication assets, each with its own unique installation date, design specifications, and operating history. As the transmission owner, it is AEP's obligation and responsibility to manage and maintain this diverse set of assets to provide for a safe, adequate, reliable, flexible, efficient, cost-effective and resilient transmission system that meets the needs of all customers while complying with Federal, State, RTO and industry standards. This requires, among other considerations, that AEP determine when the useful life of these transmission assets is coming to an end and when the capability of those assets no longer meets current needs, so that appropriate improvements can be deployed. AEP refers to these issues as transmission owner identified needs that address condition, performance and risk. AEP identifies these needs through the transmission planning criteria and guidelines outlined in this document. Specifically, this document constitutes the AEP transmission planning criteria and guidelines for End-Of-Life and other asset management needs as required in the FERC-approved Attachment M-3 to the PJM Tariff. AEP does not address any End-Of-Life or other asset management needs through the baseline planning criteria AEP files with its FERC Form 715.

AEP's transmission owner identified needs must be addressed to achieve AEP's obligations and responsibilities. Meeting these obligations requires that AEP ensures the transmission system can deliver electricity to all points of consumption in the quantity and quality expected by customers, while reducing the magnitude and duration of disruptive events. Given these considerations, criteria and guidelines are necessary to identify and quantify needs associated with transmission facilities comprising AEP's system. AEP identifies the needs and the solutions necessary to address those needs on a continuous basis using an in-depth understanding of the condition of its assets, and their

associated operational performance and risk, while exercising engineering judgment coupled with Good Utility Practices [1].

Whereas the End-Of-Life needs, as defined in the FERC-approved Attachment M-3 to the PJM Tariff, are limited to transmission facilities rated above 100 kV, these criteria and guidelines apply to all transmission voltages that comprise the AEP transmission system, including those defined as End-Of-Life needs in the FERC-approved Attachment M-3 to the PJM Tariff. In addition, projections of candidate End-Of-Life needs that result from the process outlined in these AEP criteria and guidelines will be provided to PJM in accordance with the provisions in the FERC-approved Attachment M-3 to the PJM Tariff. Current End-Of-Life and other asset management needs will be vetted with stakeholders in accordance with the provisions in the FERC-approved Attachment M-3 to the PJM Tariff.

Addressing these owner identified transmission system asset management needs, as they pertain to condition, performance and risk, will result in the following benefits to customers:

- Safe operation of the electric grid.
- Reduction in frequency of outage interruptions.
- Reduction in duration of outage interruptions.
- Improvement in service reliability and adequacy to customers.
- Reduction of risk of service disruptions (improved resilience) associated with man-made and environmental threats.
- Proactive correction of reliability constraints that stem from asset failures.
- Effective utilization of resources to provide efficient and cost-effective service to customers.

## 2.0 Process Overview

AEP's transmission owner needs identification criteria and guidelines are used for projects that address equipment material conditions, performance, and risk. AEP uses the three-step process shown in Figure 1 and discussed in detail in this document to determine the best solutions to address the transmission owner identified needs and meet AEP's obligations and responsibilities. This process is completed on an annual basis. In developing the most efficient and cost-effective solutions, AEP's long-term strategy is to pursue holistic transmission solutions in order to reduce the overall AEP transmission system needs.

**Figure 1 – AEP Process for Identifying and Addressing Transmission Asset Condition, Performance and Risk Needs**



## 3.0 Step 1: Needs Identification

Needs Identification is the first step in the process of determining system and asset improvements that help meet AEP's obligations and responsibilities. AEP gathers information from many internal and external sources to identify assets with needs. A collective evaluation of these inputs is conducted and considered, and thus, individual thresholds do not apply. In addition, factors can change over time. A sampling of the inputs and data sources is listed below in Table 1.

**Table 1 – Inputs Considered by AEP to Identify Transmission System Needs**

<b>Internal, External, or Both</b>	<b>Inputs</b>	<b>Examples</b>
Internal	Reports on asset conditions	Transmission line and station equipment deterioration identified during routine inspections (pole rot, steel rusting or cracking)
	Capabilities and abnormal conditions	Relay misoperations; Voltage unbalance
	Legacy system configurations	Ground switch protection schemes for transformers;; Transmission Line Taps without switches (hard taps); Equipment without vendor support
	Outage duration and frequency	Outages resulting from equipment failures, misoperations, or inadequate lightning protection
	Operations and maintenance costs	Costs to operate and maintain equipment
External	Regional Transmission Operator (RTO) or Independent System Operator (ISO) issued notices	Post Contingency Local Load Relief Warnings (PCLLRWs) issued by the RTO that can lead to customer load impacts
	Stakeholder input	Input received through stakeholder meetings, such as PJM's Sub Regional RTEP Committee (SRRTEP) meetings or through the AEP hosted Annual Stakeholder Summits
	Customer feedback	Voltage sag issues to customer delivery points due to poor sectionalizing; frequent outages to facilities directly affecting customers
	State and Federal policies, standards, or guidelines	NERC standards for dynamic disturbance recording
Both	Environmental and community impacts	Equipment oil/gas leaks; facilities currently installed at or near national parks, national forests, or metropolitan areas
	Standards and Guidelines	Minimum Design Standards, Radial Lines, Three Terminal Lines, Overlapping Zones of Protection
	Safety risks and concerns	Station and Line equipment that does not meet ground clearances; Facilities identified as being in flood zones; New Occupational Safety and Hazards Administration (OSHA) regulations

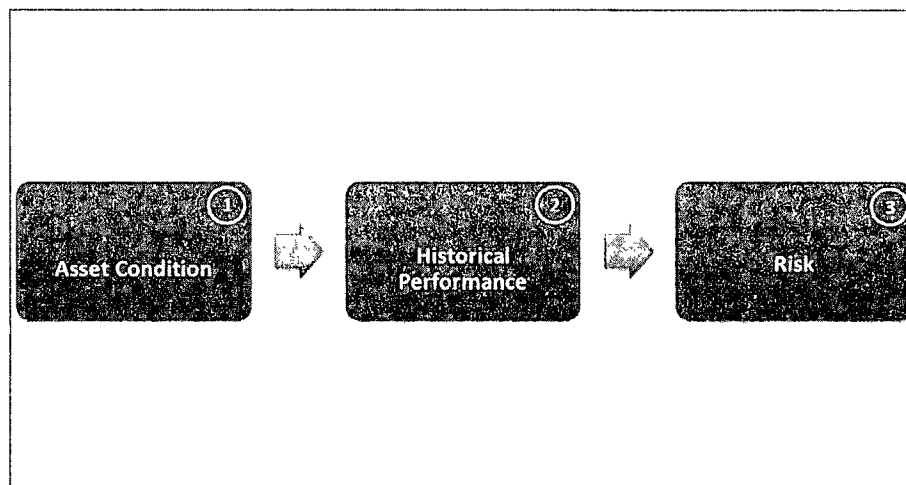
These inputs are reviewed and analyzed to identify the transmission assets that are exhibiting unacceptable condition, performance and risk, and thus, must be addressed through the FERC-approved Attachment M-3 planning process.



### 3.1 Methodology and Process Overview

The AEP transmission system is composed of a very large number of assets that provide specific functionality and must work in conjunction with each other in the operation of the grid. These assets have been deployed over a long period of time using engineering principles, design standards, safety codes, and Good Utility Practices that were applicable at the time of installation and have been exposed to varying operating conditions over their life. The Needs Identification methodology is shown below in Figure 2. AEP addresses the identified needs considering factors including severity of the asset condition and overall system impacts. These are subsequently evaluated versus constraints such as outage availability, siting requirements, availability of labor and material, constructability, and available capital funding in determining the timing and scope of mitigation.

**Figure 2 – Needs Identification Methodology**



It is AEP's strategy and goal to develop and provide the more efficient, cost-effective, safe, reliable, resilient, and holistic long-term solutions for the identified needs.

### 3.2 Asset Condition (Factor 1)

The Asset Condition assessment gathers a standard set of physical characteristics associated with an asset or a group of assets. The set of data points recorded is determined based on the asset type and class. Information assembled during the Asset Condition assessment is used to show the historical

deterioration, current condition, and future expectation of the asset or group of assets on the AEP system.

AEP annually assembles a list of reported condition issues for all of its assets in its system. A detailed follow-up review is conducted to determine if a transmission asset is in need of upgrade and/or replacement. Additionally, this Asset Condition review is used to determine an adequate scope of work required to mitigate the risk associated with a facility's performance and its identified issues. This level of risk is determined through the Future Risk assessment (Factor 3).

Beyond physical condition, AEP's ability to restore the asset in case of a failure is also considered. This is referred to as the future probability of failure adder. Typically, assets that are no longer supported by manufacturers or lack available spare parts are assigned a higher probability of failure adder.

To perform condition assessments, AEP classifies its Transmission assets in two main categories: Transmission Lines and Substations.

### **3.2.1 Transmission Line Considerations**

#### **Design Portion**

- A. Age (Original Installation Date)
- B. Structure Type (Wood, Steel, Lattice)
- C. Conductor Type (Size, Material & Stranding)
- D. Static Wire Type (Size & Material)
- E. Foundation Type (Grillage, Direct Embed, Caisson, Guyed V, Drilled Pier etc.)
- F. Insulator Type (Material)
- G. Shielding and Grounding Design Criteria (Ground Rod, Counterpoise, "Butt Wrap" etc.)
- H. Electrical Configuration
  - a. Three Terminal Lines
  - b. Radial Facilities
- I. NESC Standards Compliance
  - a. Structural Strength (NESC 250B, 250C & 250D Compliance)
  - b. Clearances (TLES-047 Compliance)

J. Easement Adequacy (Width, Encroachments, Type; etc.)

Physical Condition

- A. Open Conditions (existing and unaddressed physical conditions associated with a Transmission Line component)
- B. Closed Conditions (previously addressed physical conditions associated with a Transmission Line component)
- C. Emergency Fixes (History of emergency fixes)
- D. Accessibility (Identified areas of difficult access)

**3.2.2 Substation Considerations**

A. Transformers

- a. Manufacturer
- b. Manufacturing Date
- c. In Service Date
- d. Load Tap Changer Type & Operation History (if applicable)
- e. Dissolved Gas Analysis
- f. Bushing Power Factor
- g. Through Fault Events (Duval Triangles)
- h. Moisture Content (Oil)
- i. Oil Interfacial Tension
- j. Dielectric Strength
- k. Maintenance History
- l. Malfunction Records

B. Circuit Breakers

- a. Manufacturer & Type
- b. Manufacturing Date
- c. In Service Date
- d. Interrupting Medium
- e. Fault Operations
- f. Switched Operations

- g. Spare Part Availability
  - h. Maintenance History
  - i. Malfunction Records
  - j. Breaker Type Population
- C. Secondary/Auxiliary Substation Equipment\*
- a. Station Batteries
  - b. Control House
  - c. Station Security
  - d. Station Structures
  - e. Capacitor Banks
  - f. Bus, Cable and Insulators
  - g. Disconnect Switches
  - h. Station Configuration
  - i. Station Service
  - j. Relay Types
  - k. RTU Types
  - l. Voltage Sensing Devices

*\*AEP substation inspections include assessments of secondary/ancillary equipment. If needed, upgrades to these components are typically included in the scope of projects addressing major equipment and may not necessarily drive stand-alone projects.*

### **3.3 Historical Performance (Factor 2)**

AEP's Historical Performance assessment quantifies how an asset or a group of assets has historically impacted the Transmission system's reliability and Transmission connected customers, helps identify the primary contributing factors to a facility's performance, and baselines the outage probability used in our Future Risk analysis. The metrics used as part of this historical performance assessment include:

- A. Forced Outage Rates
- B. Manual Outage Rates
- C. Outage Durations (Forced Outage Duration in Hours)
- D. System Average Interruption Indices (T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI)

- E. Customer Minutes of Interruption (CMI)
- F. Customer Average Interruption Indices (IEEE SAIDI, CAIDI & SAIFI)
- G. Number of Customers Interrupted (CI)

AEP utilizes this standard set of metrics as a means to quantify the historical performance of an asset. These historical performance metrics allow AEP to further investigate assets that have historically impacted customers the most.

Due to the vast size of the AEP operating territory covering 11 states, AEP segments its needs into seven distinct operating company regions and six voltage classes. This segmentation ensures that variations in geography with respect to vegetation, weather patterns, and terrain can be accounted for within the process of identifying needs for each operating company area. In addition to customers of AEP operating companies, consideration for retail customers that are served at non-AEP wholesale customer service points is also included. In order to account for customers served behind wholesale meter points, AEP gathers information from the parent wholesale provider or in its absence, applies a surrogate customers per MW ratio to estimate the number of customers served by a wholesale power provider's delivery point. This customer count is used to calculate the individual metrics above.

AEP's standard approach is to annually review the historical performance of its assets based on a rolling three-year average, but in some cases AEP may extend the review period beyond three years. AEP classifies all transmission asset outage causes into the following five categories to conduct this review: Transmission Line Component Failure, Substation Component Failure, Vegetation (AEP), Vegetation (Non-AEP), and External Factors. Each transmission asset and its associated performance is quantified and compared against corresponding system totals to determine its percentage contribution to aggregated system performance. An evaluation of outage rates is also performed for Transmission line assets. The observed performance of the assets in any of these categories can point to a need that may need to be addressed.

### **3.4 Future Risk (Factor 3)**

AEP reviews the associated risk exposure (future risk) inherent with each identified asset to determine an asset's level of risk. This risk exposure is quantified assuming the probability of an outage scenario

and is based on the reported condition of the asset and the severity of that condition and what the impact could be to customers or to the operation of AEP's Transmission system. Some of the key items to assess these impacts included in the risk criteria are:

- A. Number of Customers Served
- B. Load Served
- C. Operational Risks
  - a. Post Contingency Load Loss Relief Warnings (PCLLRW's)
  - b. History of Load Shed Events
  - c. Stations in Black Start Paths

In addition to the future risk calculation performed through this process, AEP is systematically reviewing its system to identify and remediate equipment and practices that have resulted in operational, restoration, environmental, or safety issues in the past that cannot be directly quantified, but that remain as acknowledged risks in the AEP Transmission system. These include:

- A. Wood pole construction
- B. Pilot wire protection schemes
- C. Oil circuit breakers
- D. Air Blast circuit breakers
- E. Pipe type oil filled cables
- F. Electromechanical relays
- G. Legacy system configurations
  - a. Missing or inadequate line switches (e.g., hard-taps)
  - b. Missing or inadequate transformer/bus protection
  - c. Three-terminal lines
  - d. Overlapping zones of protection
- H. Non-Standard Voltage Classes
- I. Poor Lightning & Grounding Performance
- J. Radial Facilities
- K. Public vulnerability

These items as described above are reviewed on a case by case basis and considered when holistic system solutions are being developed.

#### **4.0 Step 2: Solution Development**

The development of solutions for the identified needs considers a holistic view of all of the needs in which several solution options are developed and scoped. AEP applies the appropriate industry standards, engineering judgment, and Good Utility Practices to develop these solution options. AEP solicits customer and external stakeholder input on potential solutions through the Annual Stakeholder Summits hosted by AEP and also through the PJM Project Submission process. This ensures that input from external stakeholders on identified needs can be received and considered as part of the solution development process.

Solution options consider many factors including, but not limited to, environmental conditions, community impacts, land availability, permitting requirements, customer needs, system needs, and asset conditions in ultimately identifying the best solution to address the identified need. Once the selected solution for a need or group of needs is defined, it is reviewed using the current RTO provided power-flow, short circuit, and stability system models (as needed) to ensure that the proposed solution does not adversely impact or create baseline planning criteria violations on the transmission grid. Finally, AEP reviews its existing portfolio of baseline planning criteria driven reliability projects and evaluates opportunities to combine or complement existing baseline planning criteria driven reliability projects with the transmission owner needs driven solutions developed through this process. This step ultimately results in the implementation of the more efficient, cost-effective, and holistic long-term solutions. Stand-alone projects are created to implement the proposed solution where transmission owner needs driven solutions cannot be integrated into existing projects.

#### **5.0 Step 3: Solution Scheduling**

Once solutions are developed to address the identified needs, the scheduling of the solutions will take place. As mentioned in the previous section, if opportunities exist to combine or complement existing baseline planning criteria driven reliability projects with the needs driven solutions developed

through this process, the scheduling will be aligned to the extent possible. In all other situations, AEP will schedule the implementation of the identified solutions in consideration of various factors including severity of the asset condition, overall system impacts, outage availability, siting requirements, availability of labor and material, constructability, and available capital funding. AEP uses its discretion and engineering judgment to determine suitable timelines for project execution.

## **6.0 Conclusion**

This document outlines AEP's criteria and guidelines for transmission owner identified needs that address equipment material conditions, performance, and risk. It outlines the sources and methods considered by AEP to identify assets with needs on a continuous basis and it outlines how solutions are developed and scheduled. AEP will review and modify these criteria and guidelines as appropriate based upon our continuing experience with the methodology, acquisition of data sources, deployment of improved performance statistics and the receipt of stakeholder input in order to provide a safe, adequate, reliable, flexible, efficient, cost-effective and resilient transmission system that meets the evolving needs of all of the customers it serves.

## **7.0 References**

- [1] FERC Pro Forma Open Access Transmission Tariff, Section 1.14, Definition of "Good Utility Practice".  
Link: <https://www.ferc.gov/legal/maj-ord-reg/land-docs/rm95-8-0aa.txt>
- [2] AEP Transmission Planning Documents and Transmission Guidelines.  
Link: <http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/>



**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-19:**

Reference SWEPCO's response to CARD 1-17, Attachment 4, page 1, SWEPCO Line Rebuild Program, please provide the annual SAIDI, SAIFI and customer minutes interrupted for each of the listed rebuilt lines in this program for each of the last ten calendar years.

**Response No. CARD 9-19:**

See CARD 9-19 Attachment 1 for the annual SAIDI, SAIFI and customer minutes interrupted for each of the listed rebuilt lines in this program for each of the last ten calendar years.

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Daniel R. Boezio

Title: VP Trans Field Services

Sponsored By: Wayman L. Smith

Title: Dir Trans Planning

**Hughes Springs to Jenkins Tap 69 kV (4.8 miles)**

No Distribution Customers

**Greenland to Van Buren Interconnect (VBI) North 69 kV (36.8 miles)**

No Recorded Outages

**North Huntington to Waldron West 69 kV (18.7 miles)**

<b>Month End Date</b>	<b>SERVED</b>	<b>CI</b>	<b>CMI</b>	<b>SAIDI</b>	<b>SAIFI</b>
12/31/11	1705	4215	352542	206.8	2.472
12/31/12	1696	6117	1011249	596.3	3.607
12/31/13	1655	917	112256	67.8	0.554
12/31/14	1647	869	91205	55.4	0.528
12/31/15	1633	1927	2020133	1237.1	1.180
12/31/16	1634	4546	115737	70.8	2.782
12/31/17	1635	1883	259141	158.5	1.152
12/31/18	1664	1582	79181	47.6	0.951
12/31/19	1655	7502	1080024	652.6	4.533
12/31/20	1695	1931	76700	45.3	1.139

**• Mt. Pleasant to New Boston 69 kV (42.1 miles)**

<b>Month End Date</b>	<b>SERVED</b>	<b>CI</b>	<b>CMI</b>	<b>SAIDI</b>	<b>SAIFI</b>
12/31/11	3708	3483	535952	144.5	0.939
12/31/12	3715	5004	560780	151.0	1.347
12/31/13	3701	11863	1551840	419.3	3.205
12/31/14	3680	6242	624004	169.6	1.696
12/31/15	3697	5266	613927	166.1	1.424
12/31/16	3698	7079	665407	179.9	1.914
12/31/17	3693	7184	699301	189.4	1.945
12/31/18	3701	9292	1638475	442.7	2.511
12/31/19	3713	10315	1463183	394.1	2.778
12/31/20	3742	11882	3751394	1002.5	3.175

**Clarendon to Northwest Memphis 69 kV (25.2 miles)**

<b>Month End Date</b>	<b>SERVED</b>	<b>CI</b>	<b>CMI</b>	<b>SAIDI</b>	<b>SAIFI</b>
12/31/11	1889	2797	144029	76.2	1.481
12/31/12	1914	2805	485223	253.5	1.466
12/31/13	1914	1063	146463	76.5	0.555
12/31/14	1923	4756	305094	158.7	2.473
12/31/15	1893	4694	510813	269.8	2.480
12/31/16	1893	978	87519	46.2	0.517
12/31/17	1907	5366	541587	284.0	2.814
12/31/18	1905	3540	497318	261.1	1.858
12/31/19	1895	14911	1081957	571.0	7.869
12/31/20	1903	3555	2033980	1068.8	1.868

**Northwest Memphis to West Childress 69 kV (33.3 miles)**

<b>Month End Date</b>	<b>SERVED</b>	<b>CI</b>	<b>CMI</b>	<b>SAIDI</b>	<b>SAIFI</b>
12/31/11	1768	4051	226197	127.9	2.291
12/31/12	1787	3675	341987	191.4	2.057
12/31/13	1800	4026	159834	88.8	2.237
12/31/14	1788	1314	193530	108.2	0.735
12/31/15	1763	2430	127737	72.5	1.378
12/31/16	1757	8248	500724	285.0	4.694
12/31/17	1756	3938	465468	265.1	2.243
12/31/18	1753	4683	422627	241.1	2.671
12/31/19	1760	6744	502679	285.6	3.832
12/31/20	1773	4519	1483046	836.5	2.549

**• Arsenal Hill to Longwood 138 kV (16.3 miles)**

<b>Month End Date</b>	<b>SERVED</b>	<b>CI</b>	<b>CMI</b>	<b>SAIDI</b>	<b>SAIFI</b>
12/31/11	5565	28904	2861650	514.2	5.194
12/31/12	5558	21136	2237332	402.5	3.803
12/31/13	5525	15493	1587775	287.4	2.804
12/31/14	5575	18817	1693852	303.8	3.375
12/31/15	5596	20852	1925834	344.1	3.726
12/31/16	5663	6887	1043109	184.2	1.216
12/31/17	5666	9154	1216772	214.7	1.616
12/31/18	5697	11272	1754922	308.0	1.979
12/31/19	5688	7225	1138828	200.2	1.270
12/31/20	5781	8047	2620105	453.2	1.392

• Bann to Sugar Hill 69 kV (1.1 miles)

Month End Date	SERVED	CI	CMI	SAIDI	SAIFI
12/31/11	5549	5460	351529	63.3	0.984
12/31/12	5126	3181	412974	80.6	0.621
12/31/13	5226	4643	304009	58.2	0.888
12/31/14	5271	13023	1512437	286.9	2.471
12/31/15	5288	10960	686272	129.8	2.073
12/31/16	5323	5099	408483	76.7	0.958
12/31/17	5338	6249	819111	153.4	1.171
12/31/18	5335	12702	1464820	274.6	2.381
12/31/19	5384	23791	2180812	405.1	4.419
12/31/20	5411	21143	2223437	410.9	3.907

• Jenkins Tap to Lone Star Power Plant 69 kV (9.0 miles)

Month End Date	SERVED	CI	CMI	SAIDI	SAIFI
12/31/11	6			0.0	0.000
12/31/12	6			0.0	0.000
12/31/13	6	30	12852	2142.0	5.000
12/31/14	6	12	2,586	431.0	2.000
12/31/15	6	12	816	136.0	2.000
12/31/16	6	12	1,320	220.0	2.000
12/31/17	6	12	792	132.0	2.000
12/31/18	6			0.0	0.000
12/31/19	6	8	11,034	1839.0	1.333
12/31/20	19	119	60,122	3164.3	6.263

**Report Criteria:**

Exclude Traditional Major Event Days

Exclude Interrupt Type Momentary; Include

Current Record Status Approved, Exclude:

Major Cause Code: NI; Clearing Device Code:

NI

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-20:**

Provide SWEPCO's annual system SAIDI and SAIFI due to transmission line outages, including major storm events, for each of the last ten calendar years.

**Response No. CARD 9-20:**

See CARD 9-20 Attachment 1 for SWEPCO's annual system SAIDI and SAIFI due to transmission line outages, including major storm events, for each of the last ten calendar years.

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Daniel R. Boezio

Title: VP Trans Field Services

Month End Date	SAIDI	SAIFI
12/31/2011	50.43	0.397
12/31/2012	43.00	0.377
12/31/2013	39.68	0.304
12/31/2014	51.79	0.346
12/31/2015	78.90	0.362
12/31/2016	35.54	0.301
12/31/2017	75.62	0.360
12/31/2018	45.68	0.338
12/31/2019	76.16	0.463
12/31/2020	105.83	0.498

Include Major Event Days

Exclude Interrupt Type Momentary;  
Include Current Record Status Approved  
Include Major Cause Code Distribution  
Station, Transmission Line, Transmission  
Station

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-21:**

Provide SWEPCO's annual system SAIDI and SAIFI due to transmission line outages, excluding major storm events, for each of the last ten calendar years.

**Response No. CARD 9-21:**

See CARD 9-21 Attachment 1 for SWEPCO's annual system SAIDI and SAIFI due to transmission line outages, excluding major storm events, for each of the last ten calendar years.

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Daniel R. Boezio

Title: VP Trans Field Services

Month End Date	SAIDI	SAIFI
12/31/2011	45.50	0.366
12/31/2012	33.25	0.326
12/31/2013	30.05	0.262
12/31/2014	31.09	0.287
12/31/2015	37.09	0.285
12/31/2016	29.69	0.283
12/31/2017	22.22	0.216
12/31/2018	40.11	0.313
12/31/2019	53.16	0.361
12/31/2020	60.41	0.405

Exclude Major Event Days (Traditional)

Include Major Cause Code Distribution Station,  
Transmission Line, Transmission Station  
Exclude Interrupt Type Momentary; Include  
Current Record Status Approved



**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-22:**

Provide SWEPCO's annual system customer minutes interrupted due to transmission line outages, including major storm events, for each of the last ten calendar years.

**Response No. CARD 9-22:**

See CARD 9-22 Attachment 1 for SWEPCO's annual system customer minutes interrupted due to transmission line outages, including major storm events, for each of the last ten calendar years.

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Daniel R. Boezio

Title: VP Trans Field Services

Month End Date	CMI
12/31/2011	24,126,516
12/31/2012	22,515,318
12/31/2013	20,872,028
12/31/2014	27,340,332
12/31/2015	41,811,728
12/31/2016	18,899,621
12/31/2017	40,469,645
12/31/2018	24,524,865
12/31/2019	41,049,705
12/31/2020	57,554,555

Include Major Event Days  
Include Major Cause Code  
Distribution Station, Transmission  
Line, Transmission Station  
Exclude Interrupt Type Momentary;  
Include Current Record Status  
Approved  
Exclude Interrupt Type Momentary;  
Include Current Record Status  
Approved  
Exclude Interrupt Type Momentary;  
Include Current Record Status  
Approved

**SOAH DOCKET NO. 473-21-0538  
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES  
ADVOCATING REASONABLE DEREGULATION'S NINTH SET OF REQUESTS FOR  
INFORMATION**

**Question No. CARD 9-23:**

Provide SWEPCO's annual system customer minutes interrupted due to transmission line outages, excluding major storm events, for each of the last ten calendar years.

**Response No. CARD 9-23:**

See CARD 9-23 Attachment 1 for SWEPCO's annual system customer minutes interrupted due to transmission line outages, excluding major storm events, for each of the last ten calendar years.

Prepared By: William M. Romine

Title: Regulatory Consultant Staff

Sponsored By: Daniel R. Boezio

Title: VP Trans Field Services

Month End Date	CMI
12/31/2011	21,768,478
12/31/2012	17,409,288
12/31/2013	15,808,380
12/31/2014	16,411,824
12/31/2015	19,655,318
12/31/2016	15,784,617
12/31/2017	11,888,935
12/31/2018	21,534,206
12/31/2019	28,652,627
12/31/2020	32,856,454

Exclude Major Event Days (Traditional)

Include Major Cause Code Distribution

Station, Transmission Line, Transmission  
Station

Exclude Interrupt Type Momentary;

Include Current Record Status Approved